School Shop

vol. VIII no. 7

MARCH, 1949

Assignment in Japan
by Verne C. Fryklund

Teach City Planning
by Frank C. Smith

Handy Clock Project
by Harold G. Showacre

Cast Aluminum Screwdrivers
by Schielke and Donnelly

On the cover: Fortunate is the student who receives his instruction in a well-equipped shop such as the one at Montgomery Blair High School, Silver Spring, Md. Boy pictured is preparing to make a weld.

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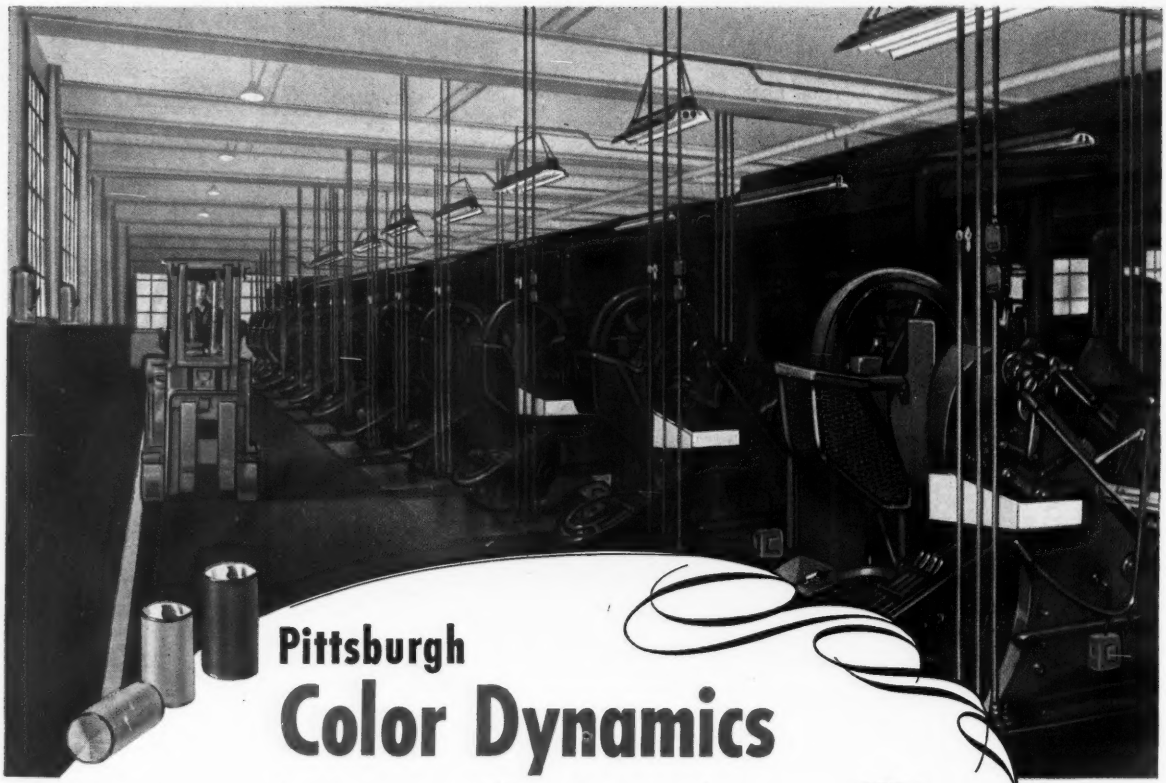

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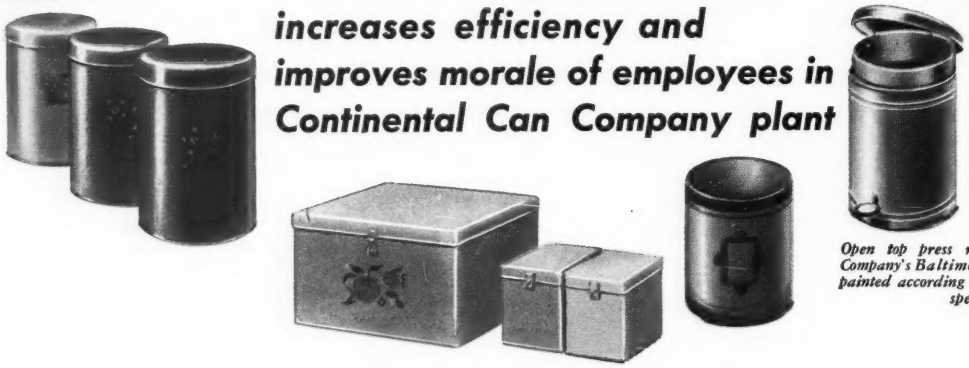

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School Shop

FOR INDUSTRIAL EDUCATION TEACHERS

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School Shop TALK

COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION

". . . To See Ourselves"

By Thomas Diamond, Professor of Vocational Education, University of Michigan

DIVESTED of dialectal embellishments, Burns, the Scottish poet, reminds us that:

If we had the power to see ourselves as others see us
It would from many a blunder free us, and foolish notion.

When we apply this fundamental truth to the field of industrial arts, we find that some teachers are prone to belittle the efforts of other teachers. They use obsolete methods; their projects are ridiculous; their discipline is far from what should be expected in a well organized classroom.

The observers of these horrible examples of teaching tend to take the attitude of the gentleman mentioned in the Bible who thanked God that he was not as other men. However, if they reserved their judgment and examined themselves, it is possible that they might find themselves guilty of the weaknesses they observe in others.

This suggests that each of us examine ourselves objectively for the purpose of discovering those things in which we excel, as well as those in which we are weak. It is unlikely that any one of us would find that we are completely bad. There is a probability that even the worst of us have some characteristics which are commendable. Therefore, if we are to do our best teaching, it is important that we discover these strengths and weaknesses and thus be in a position to make the most of the former and take active steps to improve the latter. If we fail to do this, we are likely to become complacent and go through the routine of teaching perpetuating the mistakes we are too conceited to recognize.

This raises the question of how one may effectively take stock of himself. The first essential is that the teacher be honest with himself. One can cheat at solitaire and no one but the player is aware of the fact. The distressing fact is that the player knows he has cheated and is compelled to admit to himself that he has not improved his game.

Any evaluation of teaching effectiveness must be honest in order to be helpful. Moreover, it should be confidential. A teacher may decide for himself what he considers to be the factors in good teaching and check himself against them. Or he may use a number of check lists for selfevaluation which have been prepared for use in the industrial-education field. These can be used privately by the teacher so that only he knows how he rates himself.

Obviously, the mere act of rating oneself is a waste of time unless some improvement follows. In order to bring improvement about, the teacher must approach the task with an open mind and take action that is suggested by the evidence.

Let us spend a little less time in criticizing our fellows and a little more on selfexamination and improvement of our teaching.

Out of Step

Every so often our sensibilities are shocked by the apparent myopia of school administrators. We were given a start recently when we went over the plans for a new and gorgeous high school in one of the biggest industrial centers of the nation to find that the shop facilities consisted of two "craft" rooms. Fortunately this is an exception. From coast to coast schools are adding facilities for industrial-education work at a great pace.

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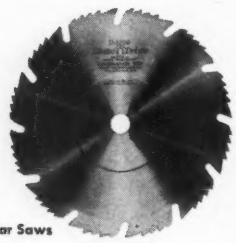

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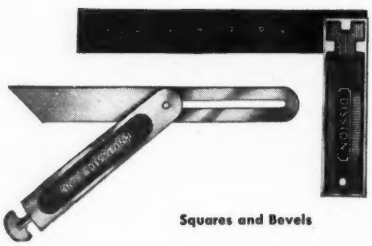

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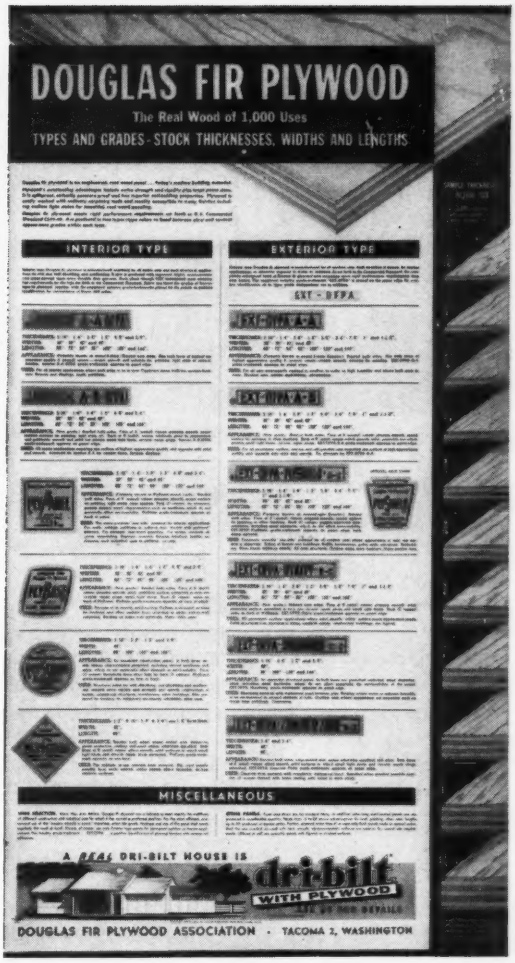

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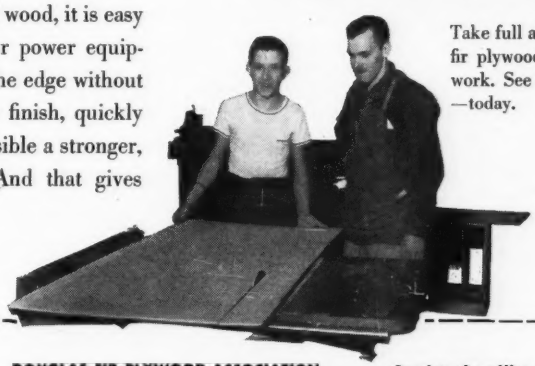

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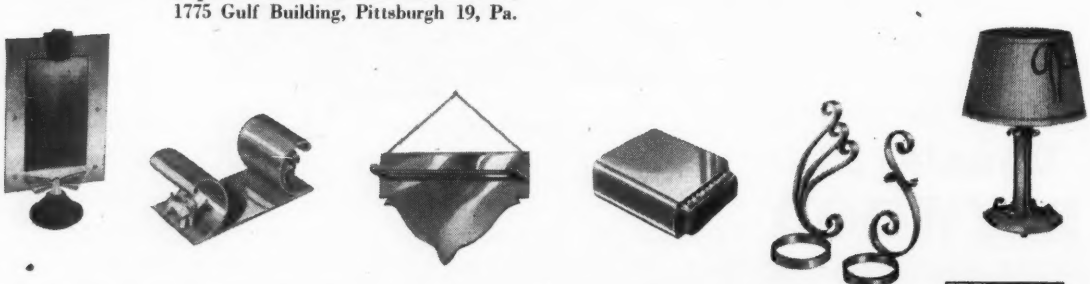

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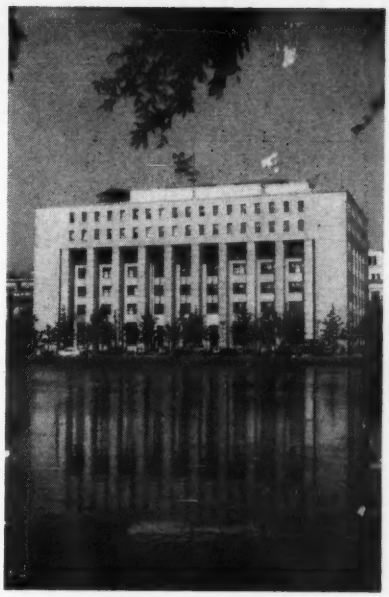
Assignment in Japan



The Dai Ichi Building in Tokyo, headquarters for General MacArthur.

By Verne C. Fryklund

This is the story of the reeducation problem of the Japanese as seen first-hand by Dr. Fryklund who served as an adviser to the Japanese Ministry of Education last fall at the invitation of the Secretary of the Army. Dr. Fryklund is President of the Stout Institute, Menomonie, Wis.

MY assignment in Japan was to prepare certification standards and four-year curriculums for teachers of vocational subjects. The request came from the Secretary of the Army, and I was to assist the Japanese Ministry of Education through the offices of the Civil Information and Education Division of SCAP. My immediate responsibility was to Dr. L. Q. Moss, formerly of Pennsylvania, who is adviser of the vocational and adult education unit with headquarters in Tokyo. The plan was to establish a pattern quite like that of vocational teacher training in the United States under federal subsidies.

At the outset, a survey of Japanese vocational teacher education was made. Nineteen schools and colleges were visited and 31 leading educators were consulted. It was soon learned that the educational beliefs of the Japanese differed greatly from our own.

Trade Experience Not Accepted

There had been no teacher training in Japanese schools as we know such training here in the United States. Vocational teachers were seldom taken from the trades and upgraded to degree status. The Japanese believed that vocationally experienced teachers were not socially and morally desirable in the schools. The instructors were mostly college-trained in subject matter. Beginning teachers were assigned as assistants and they learned to teach on the job. Generally the quality of teaching seemed quite low, though good teaching was observed in several schools.

For some time to come in Japan it will be necessary to recruit college-trained teachers for giving trade instruction. Gradually, with American guidance, it will be possible to recruit highly qualified craftsmen to become teachers and ultimately to upgrade them to degree status. However, those who could be recruited will have to be encouraged on the basis of the social service rendered rather than on remuneration. The average pay of the skilled worker in industry was $12.00 a month, while teachers were getting $8.00 at the time of this mission.

There are many excellent craftsmen in a great variety of crafts, and much would be gained if the Japanese school authorities would employ and encourage some of them to become teachers.

Joinery, not nails and screws, are used in the construction of Japanese buildings.

Few Secondary-School Students

Japanese schools are built somewhat like ours, with a great amount of playground with each school. Education before the war was compulsory through the sixth grade, but only about 10 percent of the pupils went beyond. About 90 percent of the pupils attended vocational schools or went into industry. There was no related instruction as we know it. The pupils spent all day in the shops. Industry furnished the materials, and the pupils worked, at small pay, on gadgets for industry. In the postwar plans for vocational education, however, half the school time will be devoted to related subjects and half time to the shops.

School shops are large and they are quite well equipped, though the machinery is old. There are Japanese machine shops with as many as 400 lathes, and drafting rooms with as many tables. Much equipment is obsolete. The lathes, for example, had overhead drive entirely. I saw no motor-in-head equipment. The machinery was Japanese made and patterned after American and German equipment.

Education for Citizenship to Be Stressed

The whole Japanese educational system is being reorganized after the American plan. This is in contrast to conditions before the war, when academic instruction in the first six grades was devoted largely to "Bushido" or Emperor worship and respect for military control and the honor of dying in war. There was very little study of language and practically no study of government. Government was something for the few, and the people needed only to be industrious and obey authority. The new schools of Japan will have all the subject-matter offerings of American schools.

The people will have opportunity to study and participate in government. Before the war the Japanese people had little opportunity to learn what was going on elsewhere in the world. They were led to believe that Japan was the most modern and progressive nation in the whole world.

Education before the war was planned and controlled entirely by the Japanese national Ministry of Education. There

A Japanese secondary-school machine shop with about 400 lathes. Note overhead drive.

were no school boards as in the United States. Instead there was a representative of the Ministry of Education in each town who passed directives to the teachers. He was like a superintendent of schools, but with full power. In the new Japanese education, however, there are school boards, and the people participate in the planning of educational programs. This change will be slow in realization inasmuch as the Japanese are unaccustomed to such participation. Perhaps another generation or two may pass before there will be full realization of success.

The ideologies of the Japanese must be changed from belief in Emperor worship and military control to belief in government for the people and by the people. This will be a slow process and will likely take no less than 20 years under Allied supervision.

Industry Needed for Rehabilitation

Industries are being rehabilitated so that people can work and live. The original policy of punishment by way of reducing Japan to an agrarian nation led to starvation, because Japan was mainly industrial before the war. There are 85 million people in Japan and its total size is less than that of California. As the average farm in Japan is only four acres in size, the Japanese cannot live and survive by working the soil alone.

The United States poured $400,000,000 in relief into Japan the first year of American occupation in order to prevent the wholesale starvation of the Japanese people and to keep up their morale. It was decided that their industries must be rehabilitated so the people can work and live. Our Congress appropriated $125,000,000 for rehabilitating industry. A loan of $80,000,000 was approved for the purchase of raw materials. If the Japanese can produce and sell finished goods on the world market, they can become selfsustaining without our assistance. However, if the Japanese economy cannot be rehabilitated, the United States will have to continue to pour relief money into Japan. This will be a very costly procedure for the American taxpayers. Vocational training, therefore, will play an important part in this rehabilitation process.

One of the dangers which we face is that we will build Japan strong again industrially, but that the ideologies of the young people and adults will not be changed swiftly enough. There are 19 million persons attending school at some level; there are 500,000 teachers and 300 colleges and universities, but there are only 100 resident American educators supervising the new educational program. There are too few educators to do a thorough and ready job. We must work just as hard in the changing of the ideologies of the people, so they will believe in government for the people and by the people, as in rehabilitating their industry.

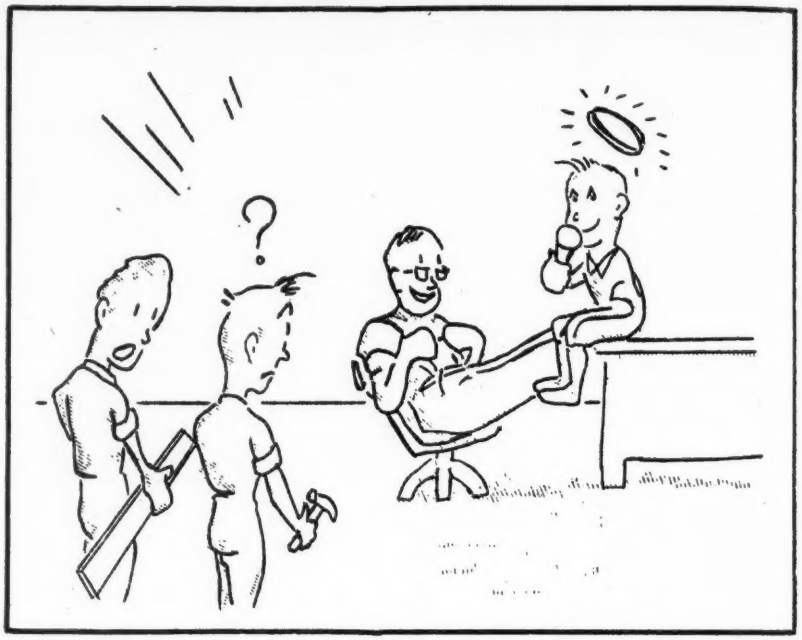
Communism is at work; and this remark has greater meaning than appears in the few words required to write it. Prewar Japanese textbooks were full of anti-democratic and anti-American propaganda, and these books must be destroyed or rewritten. This job falls on the few American educators who are scattered throughout Japan. There was a backlog of 200 books when I left Japan in August. We must make sure that the ideals of democracy have taken root with the majority of the people.

(*Continued on page* 31)

Leaders (?) in Industrial-Arts Education

By Marcus Fitzgerald

Tradesman Jake



"He's the only kid who can chase threads like the teacher wants."

TRADESMAN Jake was a machinist for many years; he learned what he knows the "hard way."

Jake qualified himself for temporary certification as an industrial-arts teacher during World War II and he was greeted by school officials with open arms. No one can rightfully question Jake's sincerity and he is especially well liked as a person by his fellow teachers. He is considered a wholesome school influence.

Jake is nonplussed about industrial-arts teaching. He has been informed not to expect to turn out machinists but such admonition was unnecessary since he quickly realized that neither the shop facilities nor the time available is sufficient for developing a high degree of technical competence. He has also been told that a comprehensive program of industrial arts should include a wide variety of industrial experiences. Jake has expanded his offering to include cold metal and some gas welding but he feels ill at ease when electricity, drafting, ceramics, et cetera are discussed. To Jake, all this talk about diversity of experience implies nothing more than a smattering which results in pupil confusion and teacher despair. Besides he feels sure that such a program is impossible.

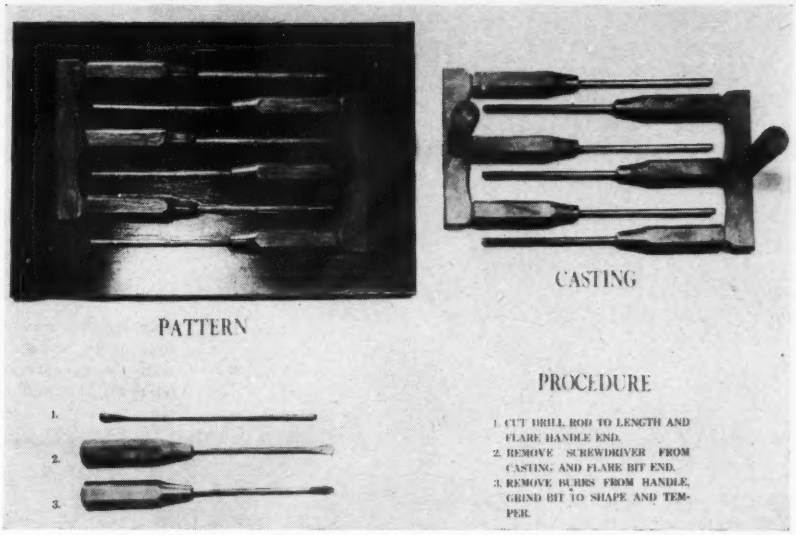
Jake prefers to work with older boys because they seem to learn so much faster. Teaching seventh and eighth "graders" simply constitutes a hard way to earn a living.

Jake may be helped considerably during his remaining period of service if someone were to explain to him in a cogent manner what the industrial-arts program is intended to contribute to the education of secondary-school pupils.

Cast Aluminum Screwdrivers Develop Much Pupil Interest

By Alfred Schielke and Joseph Donnelly

Students, State Teachers College, Trenton, N. J.


PATTERN
CASTING
PROCEDURE
1. CUT DRILL ROD TO LENGTH AND FLARE HANDLE END.
2. REMOVE SCREWDRIVER FROM CASTING AND FLARE BIT END.
3. REMOVE BURRS FROM HANDLE, GRIND BIT TO SHAPE AND TEMPER.

TESTED INSTRUCTIONAL PROJECT

DESIGNED to illustrate the use of the split-mould type of pattern, this project can be used to teach the elements of pattern-making and of aluminum casting. The finished project is useful in both the wood and metal shops and as a take-home item. It will create active interest on the part of students.

Making the pattern is relatively easy. A moulding flask is needed and a sheet of metal cut to fit between the cope and drag. Galvanized sheet iron or black iron of the thickness commonly found in school shops will flex excessively in the moulding process unless it is doubled or tripled in thickness. The metal plate shown in the drawing and photograph is 1/8" hot rolled iron. If several thicknesses of sheetmetal are used, they may be spot welded or riveted together.

The next step is to make six wooden screwdriver handles of the size and shape desired. They may be round or shaped to a hexagon or octagon. A hard, close-grained wood such as maple is recommended as it is more durable. Each screwdriver is then turned on a lathe to the desired contour as illustrated in the drawing. While still centered in the chuck, a hole is drilled in the handle to recess the wooden screwdriver shank. Dowel rods of the desired size are convenient to use for this purpose.

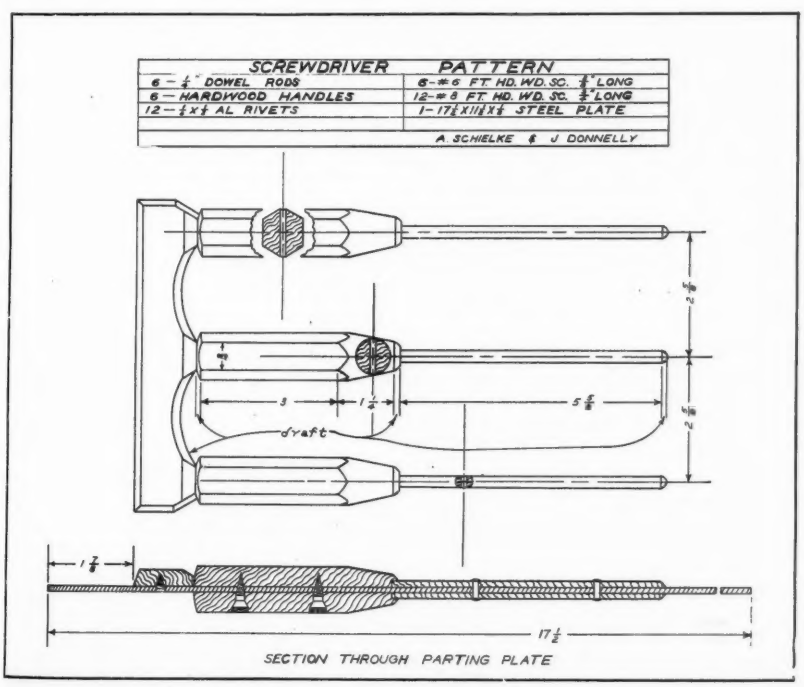
Each of the six screwdriver handles and shanks needs to be cut in half. This is easily done on the band saw with a jig composed of two straight-edge guides, one clamped on each side of the blade. The handles are guided between them and will be cut into two identical halves. The dowel rods may also be cut into two halves with the same jig arrangement.

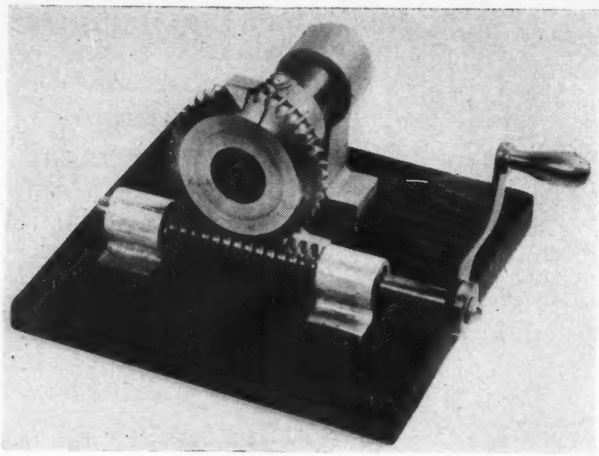
The last step is to join the split halves on each side of the metal plate. Wood screws were used to join the handles, and aluminum rivets were effective in holding the dowel rods in place. Two gate patterns are added on one side of this assembly, one on each end of the screwdriver handles as shown in the drawing.

The completed pattern is now ready for use in the foundry. It is placed between the cope and drag, the side without the gate patterns being filled first with sand. The flask is then turned over and the operation repeated. A sprue pin is held in place by hand against each gate, one for each set of three screwdrivers. Having filled the gate side of the pattern with sand and removed the two sprue pins, the flask is separated and the pattern removed.

The six lengths of 1/4" drill rod are heated and flared and placed in the mould in the impressions made by the 1/4" dowel rods. The flask is reassembled and ready for the pouring process. Aluminum is poured into each of the two sprue holes and flows through the gate opening into the screwdriver handles, thus surrounding the flared ends of the drill rod.

The casting process being completed, the two castings are removed from the flask and the six screwdrivers broken from the gates. Each screwdriver bit is flared and ground to shape and tempered. The handle may be filed lightly or polished with emery cloth to a smooth finish.


SCREWDRIVER
6 — 1/4" DOWEL RODS
6 — HARDWOOD HANDLES
12 — 1/4 x 1/4 AL RIVETS
PATTERN
6 — #6 FT. HD. WD. SC. 1/2" LONG
12 — #8 FT. HD. WD. SC. 1/2" LONG
1 — 17 1/2 X 11 1/2 X 1/8 STEEL PLATE
A SCHIELKE & J DONNELLY
draft
17 1/2
SECTION THROUGH PARTING PLATE



Visualizing Operation of the Dividing Head

By George L. Cunningham

Stressing the fundamental principle of the dividing head—the 40-to-1 ratio of the worm to the worm gear—is easy with this visual device which is an excellent project for the machine shop. George L. Cunningham is Chief Instructor, Machinist Department, Delgado Trades School, New Orleans, La.

TESTED SHOP PROJECT

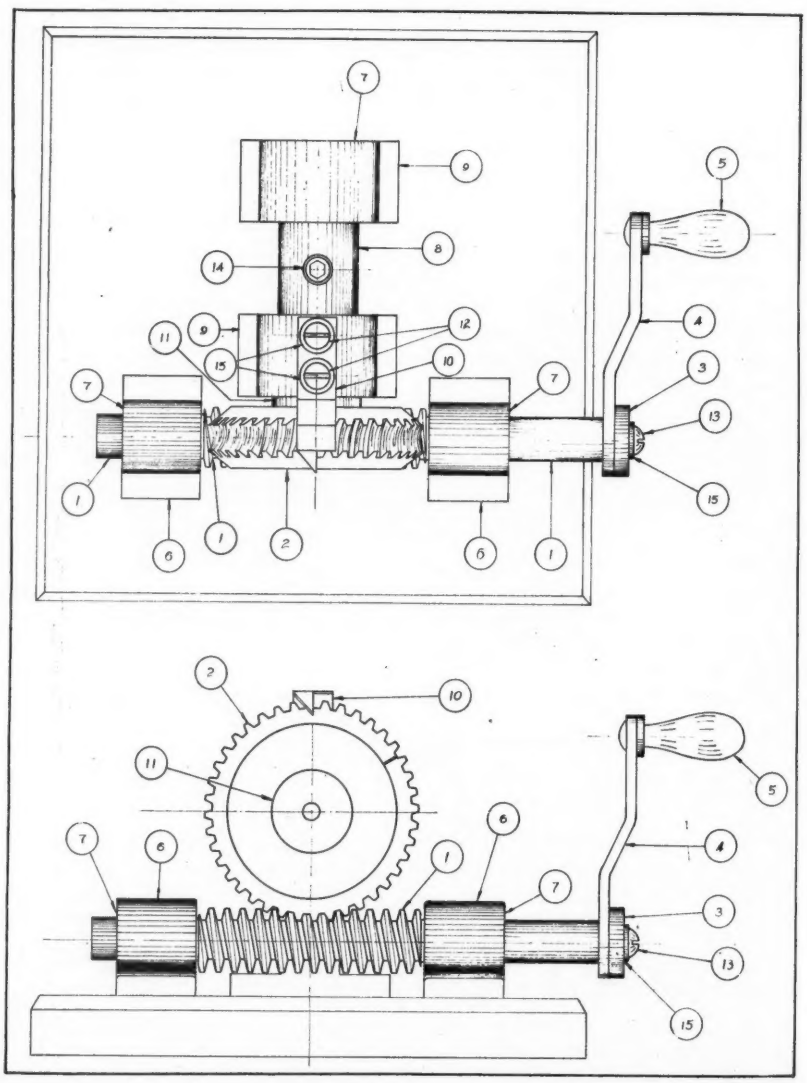
THE standard dividing head has a ratio of 40 to 1, or 40 turns of the crank or worm to one revolution of the dividing head spindle or worm gear. No matter how well this may be presented, either by sketches or lecture, there will always be a few students who cannot visualize it. With this visual aid the instructor's task is considerably lightened because the student can *see* what is taking place when the crank is being turned. The procedure is as follows:

1. The instructor has the student count the number of teeth in the worm gear so that he can *see* that there are 40 teeth in it.

2. The instructor calls the attention of the student to the fact that the worm is single threaded and that it moves the worm gear one tooth for every revolution of the worm.

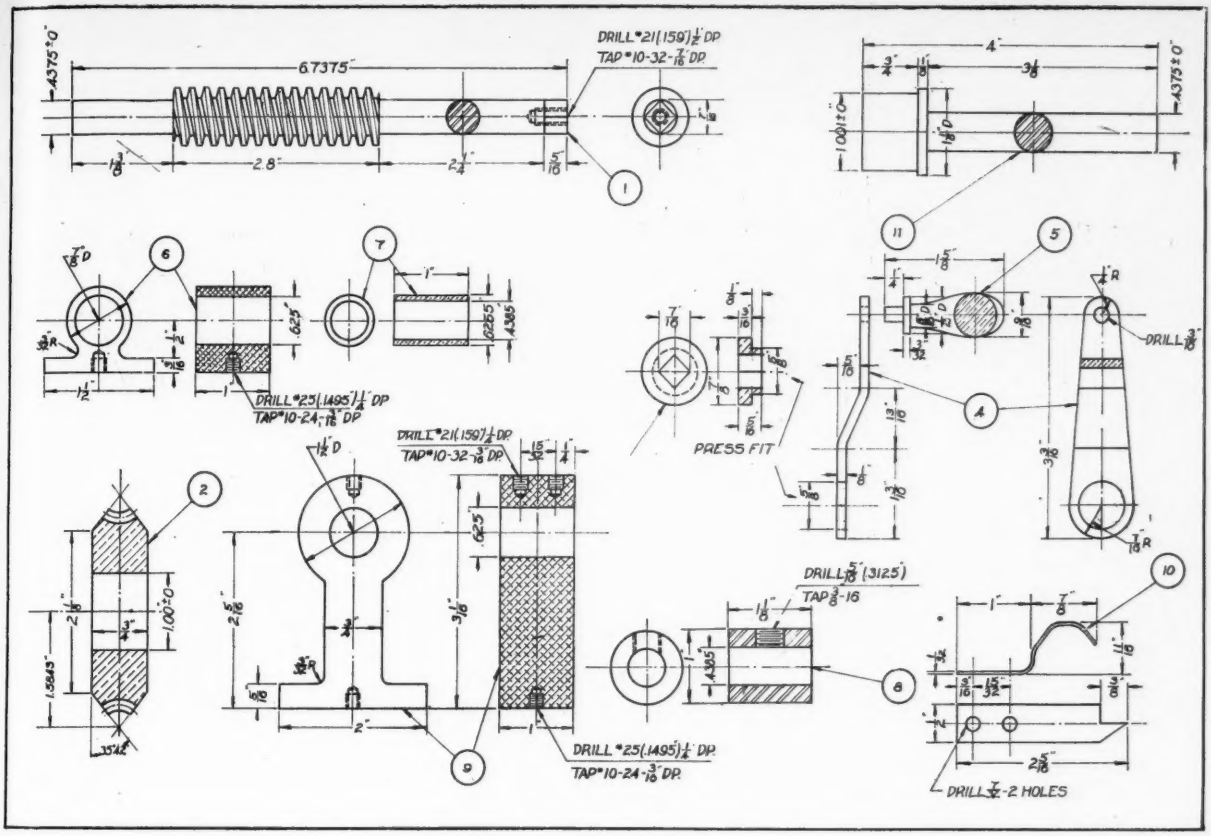
3. There is a mark on the worm gear and the instructor lines up this mark with the pointer which is attached to the bearing of the worm gear. The student is then instructed to turn the crank attached to the worm 40 times so that the mark on the worm gear will again coincide with the pointer. This procedure brings out the underlying principle on which all indexing is based—that the ratio of the worm to the worm gear is 40 to 1 or that it takes 40 revolutions of the worm to make one revolution of the worm gear.

4. The student is then told to assume that he is going to cut a square. The instructor reemphasizes the underlying principle of all indexing—the 40-to-1 ratio—by having the student write 40 as the numerator and 4 as the denominator of a fraction: $\frac{40}{4} = 10$. The resultant 10 is the number of turns required of



BILL OF MATERIAL

1—worm, steel
2—worm wheel, brass
3—crank boss, brass
4—crank, brass
5—crank handle, brass
6—worm bearing, c. aluminum, 2 req.
7—bearing bushing, brass, 4 req.
8—spacer, steel
9—worm wheel bearing, c. aluminum, 2 req.
10—pointer, c. aluminum
11—worm wheel shaft, steel
12—center screw, #10-32-1/4 l. steel, 2 req.
13—worm screw, #10-32-3/8" l. steel
14—spacer set screw, 3/8 x 16-3/8 l. steel
15—washer for #10 Am. St. screw, steel, 3 req.



Data

Worm Wheel	Pitch dia. 0.6223"
Center distance 1.5843"	Bottom dia. 0.475"
Width of tool 0.062"	Wheel:
Worm:	40 teeth
Helix angle 5° 51'	Whole depth of tooth 0.137"
Single thread	Pitch dia. 2.5464"
Linear pitch 0.2"	Throat dia. 2.674"
Addendum 0.0638"	Radius of curvature 0.247"
Outside dia. 0.75"	O. D. gear 2.76"

the crank and worm for indexing a square.

5. The instructor attaches a pencil to a surface gage and has the student draw a line horizontally across the face of the worm gear near its top. The student then turns the crank ten turns and again draws a horizontal line across the face of the worm gear. This operation is repeated two more times and when it has been completed there will be a square drawn on the face of the worm gear.

6. The student then makes the calculations necessary for cutting flats, $\frac{40}{2} = 20$ turns of the crank; a pentagon, $\frac{40}{5} = 8$ turns of the crank; an octagon, $\frac{40}{8} = 5$ turns of the crank; and a decagon, $\frac{40}{10} = 4$ turns of the crank. In each case the student uses the surface gage and pencil to draw the horizontal lines across the face of the worm gear so that he can *see* the result of his calculations and indexing by the figures drawn on the face of the worm gear. I have found the foregoing a simple and efficient method of teaching the fundamentals of indexing. It also makes a profitable project for the teaching of the various machine operations.

1. The worm, piece #1, is made of 3/4" diameter cold rolled steel centered perfectly and then placed between centers and a recess 1/4" wide is turned to the bottom diameter of the worm on each end of the thread for thread-tool clearance. Leaving the worm shaft full size eliminates any possibility of spring or chatter during the thread-cutting operation. After the threading has been completed, the shaft is then turned to 0.4375" diameter.

2. The worm gear, #2, is made of bronze and is drilled, bored, and rough turned in the lathe. Shaft, #11, is machined according to the drawing and then pressed into the worm gear. This assembly is then mounted on centers in the lathe and the worm gear finished to the dimensions given on the drawing. The assembly is then mounted on centers in the milling machine, the table of which has been set to the helix angle of the worm thread and the worm gear teeth are gashed. After the gashing operation has been completed, the milling-machine table is returned to its normal position and the dog removed from the assembly, leaving it free to turn or revolve on its centers. The gashing cutter is replaced by a hob and the worm gear teeth are completed by hobbing. (Both gashing cutter and hob were made by the students.)

3. The crank, #4, is a piece of sheet brass machined and formed to the dimensions given on the drawing. Boss #3 is made and pressed into crank #4. Crank handle #5 is made of 5/8" diameter brass, machined and pressed into crank #4.

4. The two worm shaft and two worm gear bearings are made of cast aluminum and are machined according to the drawing. Both the worm shaft bearings, #6, and the worm gear bearings, #9, are drilled and tapped to receive #10, 24 flat-head machine screws to fasten them to the wood base.

5. There are four bronze bushings, #7, two for the worm shaft and two for the worm gear shaft bearings. They are drilled, bored, turned, and cut off in the

(*Continued on page* 12)

Develop Photographs Without a Darkroom

By Harry A. Goldstein

Utilizing the sun and a few other inexpensive commodities, you can teach this photography technic to pupils who may have the impression that it costs too much to develop pictures. Harry A. Goldstein is an instructor in photography at Tucson, Ariz., Senior High School.

In the first step of development the printing-out paper and the negative are placed in the printing frame.

IT is not necessary to forego instruction in the principles of photography merely because you do not have darkroom space or equipment. With a supply of sodium thiosulphate (called "hypo" in the jargon of the photographer) you are all set to teach practical developing technics that any pupil can learn. Many youngsters are discouraged from experimenting in this fascinating field. With this inexpensive, simple method of producing good pictures, they need no longer be reluctant to try. The method here discussed has proven successful with children as young as seven years.

The basic materials needed can be easily and cheaply acquired. Either a sheet of plate glass or a small printing frame is necessary. Also, the student should have two small trays or soup bowls from the kitchen, plus a pound of hypo crystals from the local photo shop. Caution them not to buy the commercial prepared fixing bath because the chemicals in it will have an adverse effect on the printing out paper. This paper, which can be purchased at the photo shop where the hypo mix is sold, darkens as soon as it is exposed to the sun. Do not allow the student to open the package in the light or he will have no paper to work with.

The frame is placed in the sun. The paper beyond the edges of the negative begins to darken at once when exposed to light.

As the first step in making a picture the negative should be placed in the frame with its dull side toward you. The package of printing out paper should be opened in a dark place, the glossy side of the paper is placed against the dull side of the negative, and the printing frame closed. Paper not used should be returned to the light-tight envelope.

The printing frame with negative and paper should be placed in the sunlight. It will be seen almost at once that the area beyond the edges of the negative darken almost immediately after being placed in the sun. The paper will darken rapidly. It should be allowed to remain in the frame in the sun until the paper around the edges is a deep purple.

If there is any doubt that the negative has been exposed for a sufficient length of time, the frame can be opened in the dark. By looking in at the back of the frame it is possible to check on the status of the exposure. An exposure is not finished until there is good detail in the shadow portions of the picture.

The student should next prepare two trays or soup bowls with four ounces of water in each. In one place a teaspoonful of hypo crystals. The crystals should be thoroughly dissolved before the picture may be put in. Rocking the tray or bowl back and forth will prevent streaks from appearing on the completed picture. The picture should be allowed to stand in the floating bath no more than two minutes or it will soon begin to fade away. Next, the picture is placed in the water. The procedure is repeated with the picture in the water bath. The tray or bowl should be rocked back and forth and the picture allowed to remain in the water bath no more than two minutes.

Drying the picture after it has been removed from the bath is an important procedure. First, place the picture on old newspapers and allow it to remain there until it is almost dry. Then, place the picture between pages of a magazine to insure that the picture will be flat.

The pictures produced by this simple method may be exposed to light.

The young photographer should be encouraged and taught to mount his pictures in a photo album in order to show them at their best and to protect them.

Checking on the exposure. This can be done in an unlighted area by opening the back of the frame and looking at the picture.

Note: All photographs on this page are the work of advanced students of photography, Harold Lee and Mary Dunn, at the Tucson Senior High School.

Dividing Head . . . *from page* 11

usual manner and then installed in the aluminum bearings.

6. The spacer, #8, is made of 1" diameter cold rolled steel and its function is twofold; it not only acts as a spacer between the two bearings, #9, but also takes up the thrust of the worm gear shaft.

7. The pointer, #10, is made of #23 B.W.G. sheet aluminum, cut and shaped as indicated on the drawing.

A picture developed by this method. Trays are used for two immersions of the negative—one in "hypo" mix and one in water.

Make This Sewing Box

By Mervyn T. Jones

Here is a unique project which combines several technics and materials. The student will get an opportunity to see the interdependence of industrial processes and will produce a fine object for home use. Mervyn T. Jones teaches in the Stewart Junior High School, Norristown, Pa.

TESTED INSTRUCTIONAL PROJECT

WORKING with plastics, using woodworking technics, and applying "flocking"—all these are combined in this sewing-box project. Beginners get an opportunity to learn something of the properties and characteristics of plastic materials. They are called on to demonstrate fundamental woodworking procedures. And, in the flocking method, they are introduced to a technic which, once learned, is always of value.

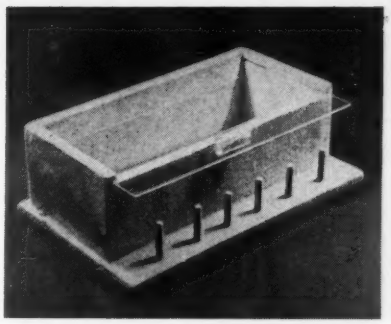
Lucite or Plexiglas are probably the best plastics for use in this project. There are no special tools that are required to cut the plastics pieces to size. If this is the class' introduction to plastics it would be wise to accompany the simple cutting operation with a more extensive demonstration of plastics under various conditions and in various uses. This will serve to open up the fascinating plastics world to the students and to show them the great potentialities inherent in this material.

After the wood pieces are cut, they may be assembled with glue and finishing nails. The wood should be painted or stained if flocking is not applied, depending on the individual's choice. Since only small pieces are required, it is possible that the students can bring in the necessary material in the form of discarded boxes. If no plastic is available, the top may be constructed of plywood.

Flocking requires a few pieces of special equipment with which many shops may not be equipped. However, it is possible to find materials to put together a simplified system for applying the flocked finish which does not necessitate any equipment beyond a large box with a glass door (the size of the box used will, of course, depend on the project which is to be flocked) and two old vacuum cleaner motors. The sewing box illustrated was given a rayon finish by utilizing the following procedures:

BILL OF MATERIALS

Part	*Pcs.*	*Size*
Base	1	9⅞" x 6" x ⅜"
Back	1	9⅜" x 2-13/16" x ⅜"
Front	1	8⅝" x 2½" x ⅜"
Sides	2	3-15/16" x 2-13/16" x ⅜"
Spindles	6	1½" x 3/16" dowels
Top	1	8-15/16" x 3-15/16" x .060 (Lucite or Plexiglas)
Handle	1	1¼" x ⅜" dia. (Lucite or Plexiglas)

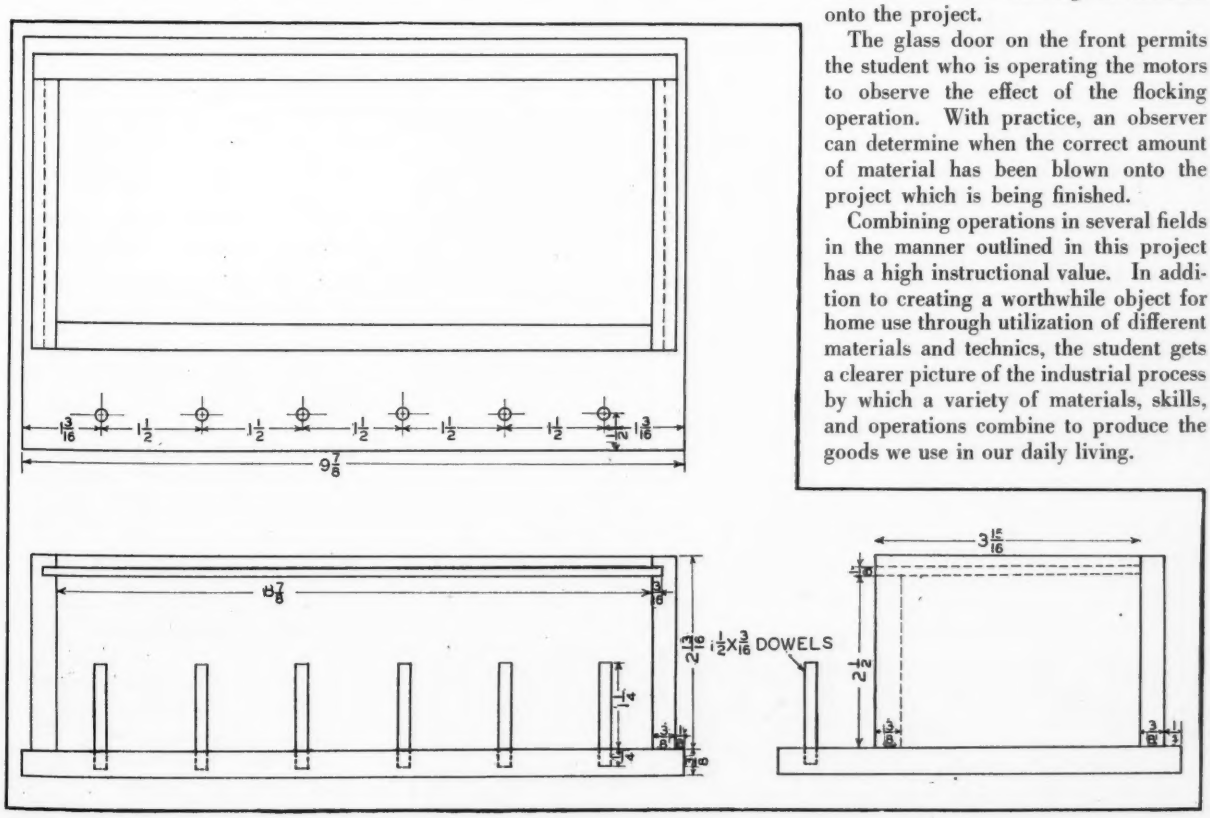


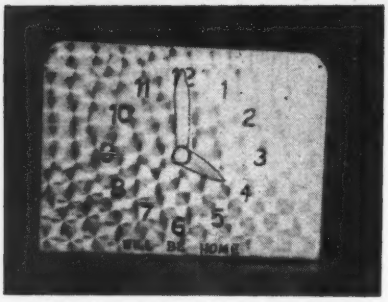
The completed sewing box. Note that the plastic top slides forward to provide easy access to the contents. The "flocked" finish was obtained by using the procedures outlined in this article.

Mount one motor at rear of box. This is used to withdraw air, creating a negative pressure within. The second motor is used to blow the flocking material onto the project from the front. The object to be flocked should be painted or shellacked first—and placed in the box. The finishing material is on the box bottom. The front motor is fitted with a hose which is used for blowing the material onto the project.

The glass door on the front permits the student who is operating the motors to observe the effect of the flocking operation. With practice, an observer can determine when the correct amount of material has been blown onto the project which is being finished.

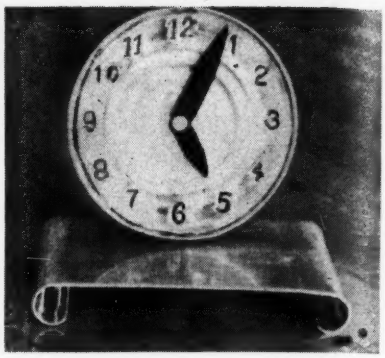
Combining operations in several fields in the manner outlined in this project has a high instructional value. In addition to creating a worthwhile object for home use through utilization of different materials and technics, the student gets a clearer picture of the industrial process by which a variety of materials, skills, and operations combine to produce the goods we use in our daily living.





Handy Clock Is Good Take-Home Junior Project

By Harold G. Showacre



This project fits nicely into the metalworking unit of junior-high industrial arts as it can be used to teach several objectives. Harold G. Showacre is an instructor at the Deal Junior High School, Washington, D. C.

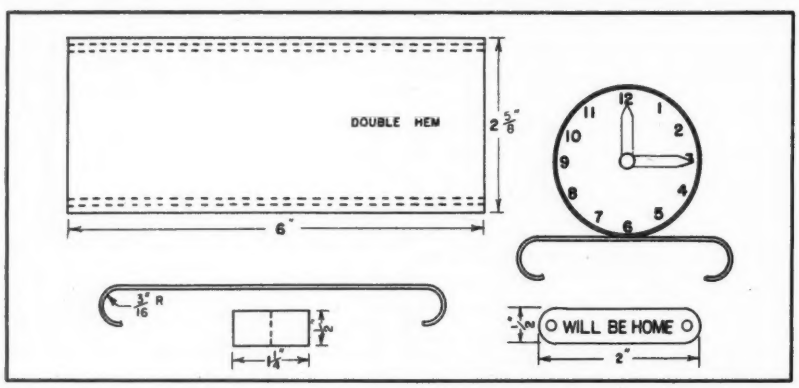
TESTED 33 PROJECT

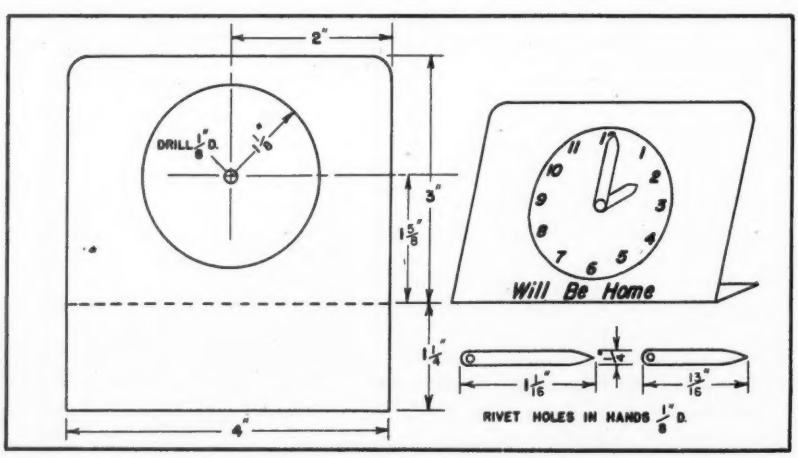
HERE is a project which is very useful around the average home. It is a clock which can be set by any member of a family to inform others when he or she will be home. It is especially handy for mothers who spend some of their afternoons shopping or at bridge parties.

Many of the instructional objectives of industrial arts can be attained with this project. It stimulates interest, presents a challenge, utilizes materials which require modern industrial processes for working, and involves several hand- and machine-tool skills.

The project itself is very simple to construct. It can be used as a regular project or as a fill-in project for the rapidly moving student. Two designs were developed to make it possible for shops with little or no copper or brass to construct it. The top drawing shows the clock as constructed from a tin can. When made in this manner, the length of the hands depends on the size can used since the bottom of the can is used as the face. The face is fastened to the base by means of a clip bent at about 70° and soldered to the back of the face and to the base. A plate of brass with "Will Be Home" stamped on it is riveted to the base.

The bottom drawing shows the clock as made from copper or brass. The large plain surface is enriched by putting a circular type finish on it. This is done by placing emery powder or valve grinding compound on the front or face and placing under a revolving soft wood dowel in a drill press. Each time the press is brought down a fine circular scratch is made. These spots should overlap one another. The numbers are stamped on the face and filled with black lacquer. The material of which the clock is made is not critical since any metal can be decorated but #18 gage should be about the right thickness.





Convention Calendar

March 3-5, **American Society of Training Directors,** Hotel Carter, Cleveland, Ohio.

March 17-19, **New Jersey Vocational and Arts Association,** Asbury Park.

March 23-26, **Western Arts Association,** Dallas, Tex.

March 24-26, **Illinois Vocational Association,** Peoria.

March 24-26, **Ohio Industrial Arts Association,** Hotel Deshler-Wallick, Columbus.

April 6-9, **Eastern Arts Association,** Hotel Statler, Boston, Mass.

April 14-16, **Texas Vocational Association,** San Antonio.

April 18-21, **National Vocational Guidance Association,** Stevens Hotel, Chicago, Ill.

April 20-22, **New York State Vocational and Practical Arts Association,** Albany.

April 21-23, **Michigan Industrial Education Society,** Civic Auditorium, Grand Rapids.

April 28-30, **Indiana Industrial Education Association,** Turkey Run.

May 7 and 8, **Wisconsin Association of Vocational and Adult Education,** Hotel Schroeder, Milwaukee.

May 12-14, **American Industrial Arts Association,** St. Louis, Mo.

June 22-24, **Pennsylvania Vocational Association,** Eagles Mere.

No April Foolin'

WE mean what we say about the April number. The SCHOOL SHOP Planning and Directory issue really will be the best ever. It will have features found nowhere else. Look for it next month!

Teaching Tools

POINTERS ON INSTRUCTION and SHOP ADMINISTRATION

By John F. Nowak

Ventilating the School Shop

CERTAIN chores should be performed almost automatically by the experienced shop teacher before, during, or after a shop session. One of these is seeing to proper ventilation. Shops become stuffy and the air within them is frequently conducive to sleep rather than to effort on the part of students.

The teacher will usually make window adjustments in the morning while preparing for the shop day. This usually takes the form of top and bottom openings which permit fresh air entry and stale air exit. Early mornings in most sections of the country have cool and crisp outside air. Usually this means that the window openings the shop teacher sees as necessary are only slight ones.

As the day goes on, the sun may grow strong. If the shop has a class of, say, 25, plus a teacher, working in it, the air may become stuffy, even foul.

The easiest check-test to determine the condition of the air in a school shop is to step outside once in a while and breathe deeply of the air there. Since the teacher has been subjected to the air within the shop for a period of time, he will be quick to notice any marked difference between the hall or corridor air and the air in the shop. He will then know whether his shop does or does not require attention to its ventilation.

Some teachers of shopwork may have wondered how it is that a supervisor can detect bad air in a school shop so quickly. The answer, as pointed out in the discussion above, lies in the fact that the supervisor has just come from the hallway or corridor where circulation of air is normally good. If the air in the shop is bad he will notice it immediately. Unless he has a cold or a nose ailment, it is hardly possible for the supervisor to fail to notice the difference.

Try the simple method discussed here to check-test the air in your shop. Do it several times during each shop session. The chances will then be good that you and not someone else will be the first to notice the need for better ventilation.

Questions and Answers

Q. How does drill differ from testing in a class lesson? (R.N.)

A. Spot testing takes place throughout a class lesson in different ways. Examples are: questioning by the teacher, blackboard work, completing an operation, and so on. Drill is an important part of testing. Drill presents an opportunity for individual effort by all learners participating in the lesson at the same time and is so indicated on the teacher's lesson plan.

Q. What are good sources of motivation? (D: R.)

A. (1) An experience of student or teacher.
(2) Newspaper, magazine, or similar articles.
(3) A hypothetical situation.
(4) A trade practice.
(5) A thought-provoking question.
(6) A "live" demonstration.

Q. Please explain why my molding plaster is not always but sometimes quite chalky, seems to lack strength, and may be taken from the same sack where most molds are satisfactory. (J.R.M.)

A. Check the following possibilities:
(1) Container unclean.
(2) Using old plaster or plaster stored in damp place.
(3) Mix at bottom of sack.
(4) Too much water in the mix.

Question Box

As a complement to this department, readers are invited to send in questions which relate to methods of teaching shopwork. If a personal reply is desired, include a stamped, selfaddressed envelope. Send questions to:

John F. Nowak
Postoffice Box 869
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Better than a large planer on extremely short, narrow, or thin stock. In fact it will do some jobs no large planer can even attempt—such as planing material as short as 6½"; planing hard woods down to 1/16" thick, smooth as silk and to a thousandth of an inch precision without tearing. Piles up big money savings by salvaging short and thin scrap.

Massive, one-piece main frame. Has the extra weight others lack for hard use. Powerful, grooved steel infeed roll. Two table idler rolls—often omitted in inferior machines. Power driven rolls in bronze-bushed self-aligning journals—also automatically adjust when work thickness varies—an exclusive feature.

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No troublesome clutch. Quieter. Instant power feed control, without stopping the motor, engine or lineshaft power.

12¼" x 20" TABLE

Thick walls and exceptionally well ribbed, normalized table casting stays flat and true. Choice of 1½ and 2 H.P. direct to cutterhead, or v-belt motor drive. Bench or complete floor type units. Also drives from lineshaft or gasoline engine.

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For efficient sharpening of hand tools without danger of damage to tools or personal injury. Simplified self-adjusting friction roll drive. No countershaft or extra belt. Peripheral speed remains constant as wheel wears. No water thrown on operator. Permits proper pressure control. Operator works on top of the wheel. Large tool rest. the first with adequate adjustment.

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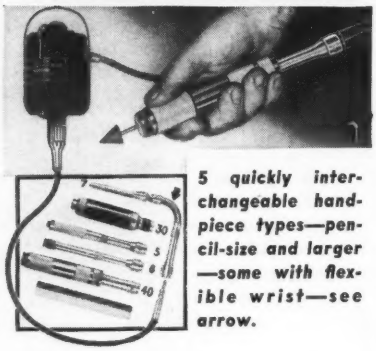

5 quickly interchangeable handpiece types—pencil-size and larger—some with flexible wrist—see arrow.

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Foredoms provide extra power and longer motor life because motor is not dwarfed to fit the hand. That is why they are the preferred type of small grinders among skilled craftsmen.

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Teach City Planning in Drawing Classes

By Frank C. Smith

Redford High School
Detroit, Michigan

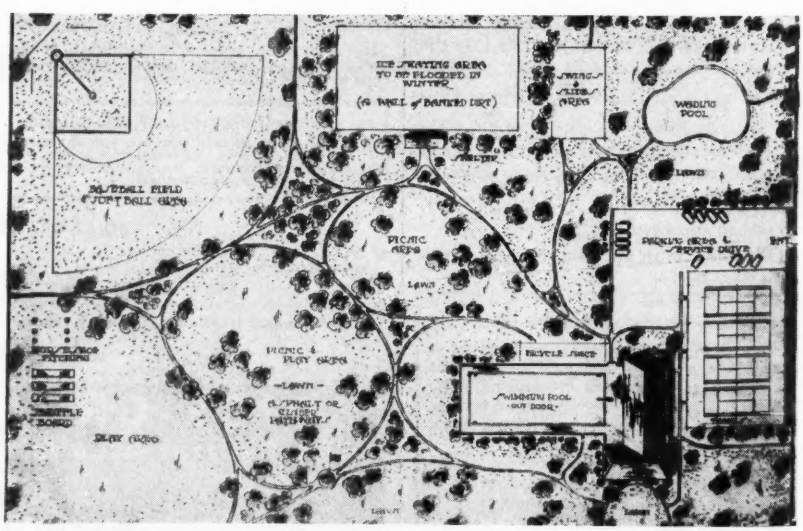
PART of the juvenile delinquency harvest we have gotten in late years can be traced to the seeds of poor city planning in the past. The failure to provide adequate play areas, to create community focal points, and to plan against overcrowding of urban sections has resulted in planless cities and maladjusted youth populations. Now is the time to take definite steps to arrest the dangerous tendency to chaos in city developments. A golden opportunity to educate the high-school boy and girl to their future roles as alert and community-conscious consumers and parents lies in the architectural drawing class in the secondary school.

Most pupils of our time are alert to some or most of the needs of our society. Their social-science classes and some of their daily reading matter point up the facts of modern life. One way in which they can take *action* when they become adults on a front that has proven itself to be somewhat vulnerable when attacked by informed citizens' groups is through civic action to improve city planning. The technical information the future citizen will need for this action can be gotten in his high-school drawing class.

The student who takes a course in architectural drawing will not necessarily follow it as a profession. Through planning his own house design in class, he will be made aware of the need for greater coordination in planning neighborhoods. The same careful planning that is required to make a house work *efficiently* can be applied to his community. He can be inspired to look about him to see what can be done locally. He will discuss such problems with his parents, thereby becoming a missionary in the furtherance of community improvements. In all discussions it must be pointed out that each citizen has it within his power to improve his own community. The architectural drawing teacher should lead these discussions toward a realistic and informed point of view.

At Redford High School we believe that a student should have at least two semesters of mechanical drawing before he attempts architectural drawing. There are four semesters of architectural drawing available. We progress from sectioning and detailing of typical house construction to perspective drawing, front elevation rendering, and laying out landscaping plans for a 1½ story house.

We can avoid the all-too-familiar pattern of the past in community planning. Too often we have laid out streets, utilizing every lot possible and allowing the temporarily residual unsold lots to become playfields until they were sold and the streets became the "play" areas. This was frequently followed by drives to "make the streets safe for our children" after the inevitable series of accidents occurred. What we could have done in our city and town planning in the past we must do in the future.



A drawing of a proposed community center.

NEWS

What's Doing in the Field of INDUSTRIAL EDUCATION

Clear Lake Workshop

CLEAR LAKE, Michigan, was the scene of a highly successful Industrial-Arts Workshop attended by 125 educators from Michigan and surrounding states last January. Work was done by eight subcommittees on instructional brochures characterizing desirable methods of teaching and by five subcommittees on an expanded outline for a proposed industrial-arts bulletin. There were twelve exhibit-demonstrations.

Accepted by the Workshop membership was the following basic philosophy for industrial-arts education: (1) industrial arts is general rather than vocational; (2) it is appropriate for both boys and girls; (3) it is as necessary for the bright student as for the student who has difficulty adjusting to the curriculum; (4) it is a rich environment for achieving desirable educational goals which are characterized by pupil growth, planning, evaluation, etc.; (5) the acquisition of knowledge and skill may be achieved as a byproduct rather than as a direct objective of instruction.

The director of the Workshop was C. T. Anderson of the Detroit, Mich., Board of Education.

The Workshop was sponsored by the State Industrial Arts Committee which was established by the State Department of Public Instruction.

Texas Roundup

TEACHERS and administrators of the Texas Vocational Association whose fields are agriculture, business and distributive education, homemaking, guidance and rehabilitation, industrial arts, or trades and industrial education will hold their eighth annual convention in San Antonio, April 14 through 16.

Pennsylvania Conference

THE Pennsylvania Industrial Arts Conference this year will be held at the California, Pa., State Teachers College on April 22 and 23. John Ludington will be a featured speaker at this, the 14th annual conference.

Long Island Exposition

FLORAL PARK, L.I., will be the scene of an exposition this month stressing the manner in which education as provided in Long Island contributes to the industrial growth of the area. Sponsored by the Long Island Vocational and Industrial Arts Association, the exposition will demonstrate to the general public, industrial and commercial employers, and civic-minded organizations that the product of the area's high schools is prepared to fill jobs in industry requiring skill. Sewanhaka High School will be host to the exposition which will be held on the 29th.

Missourians to Meet

SPONSORED jointly by the College of Education of the University of Missouri and the Industrial Education section of the Missouri State Department of Education, a conference on industrial education will be held at the University campus in Columbia on April 22 and 23.

Silversmithing Conference

THE Third National Silversmithing Conference will be held at the Rhode Island School of Design, Providence, from August 1 to 26, it was announced by the sponsors, the Handy and Harman Company Craft Service Department. As in the past, a European-trained silversmith and teacher will conduct the conference. Conferees will do actual work on projects of their own design and will be aided by individual help from the instructors. The list of participants will be released April 1.

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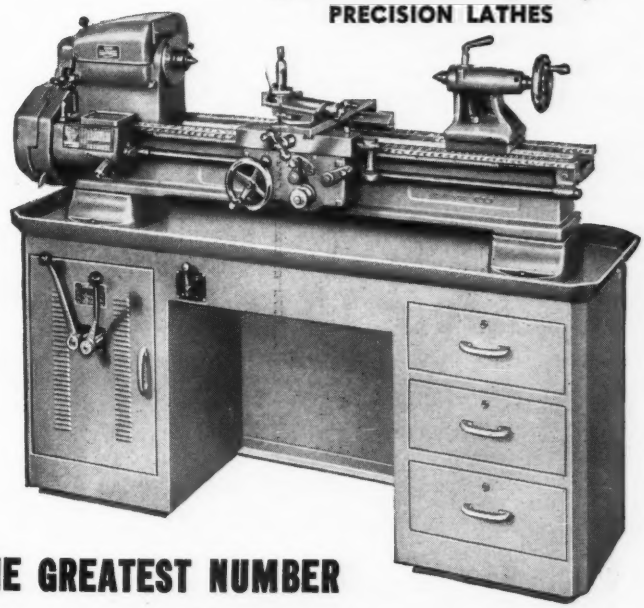

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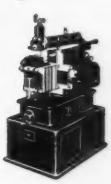

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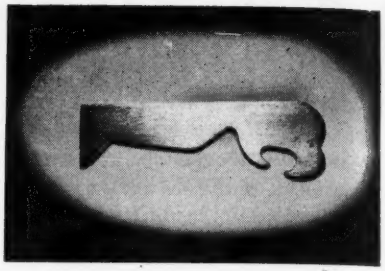
Bottle Opener Project for the General Shop

By David P. Elias

Students have an opportunity to use a variety of skills and tools in this useful project. David P. Elias is a general shop teacher at the Long Island City, N. Y., High School

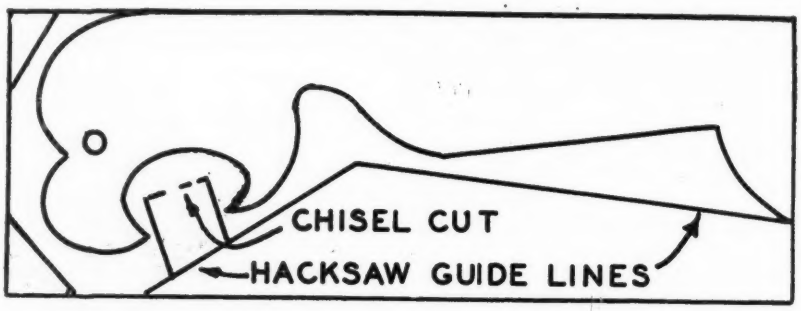


FOR beginning students, this bottle opener has the advantages of using a minimum of materials and of requiring several operations. The teacher thus gets an opportunity to instruct in the making and using of templates, hacksawing, and filing.

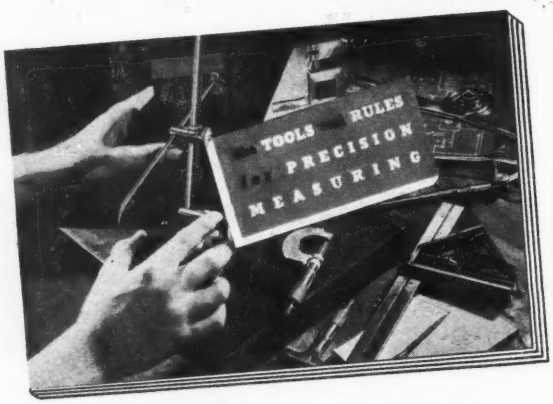
The student will need to use a hacksaw, scriber, flat file, round file, ¼" cold chisel, machinist hammer, and a large nail set. The only materials required are a piece of cold rolled steel, ⅛" x 5" x 1¾", and emery cloth.

To make the bottle opener, a template should be prepared and the design should be scribed on the steel blank. Hacksaw lines should be indicated (see drawing) as a guide for sawing. The blank steel should be sawed to rough shape. The cold chisel and hammer should be used to remove stock in the mouth of the opener. Emery cloth can be used on the heads of both hammer and chisel if they slip during this operation.. The edges should be filed down to the scribed line. A round file should be used on the inside curves and both sides should be draw filed. The nail set should be used to make an eye in the head of the opener.

When the metalwork is completed on the project it should be polished with an emery cloth and oil. The finished product will prove of value in the home and the student will have mastered several technics of metalworking in an interesting project.



ALL ABOUT MEASURING



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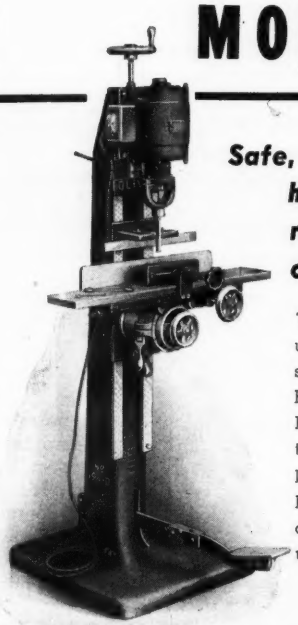

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This "Oliver" Mortiser is ideal for use in the school shop. Cuts smooth, clean, accurate mortises. Handles a wide range of work. Has compound table adjustable to any angle. Adjustments quickly made at motor-head and table. Has latest safety features. Sturdily built for years of continual use.

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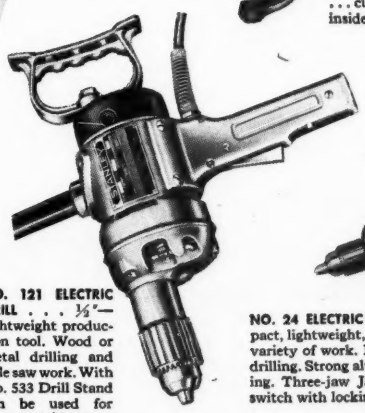

NO. 121 ELECTRIC DRILL . . . ½"—lightweight production tool. Wood or metal drilling and hole saw work. With No. 533 Drill Stand can be used for heavy drill press work.

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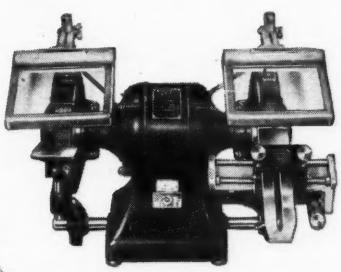

NO. 677 EDGE TOOL GRINDER . . . 7" x 1" wheels, ½ h.p.—designed for industry and school shops. Operates at correct slow speed for edge tool grinding. One wheel for tool grinding, one for general grinding. "Fluid-Lite" Eye Shields connected into motor circuit. Patented fixture for grinding plane irons up to 2⅜" and any size chisel.

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2¼" Maple Top

Nothing like it anywhere in open frame benches for ideally answering the students' needs in size, construction and equipment. Frames are extra heavy material, with pinned, mortised and tenoned joints; girts full 5" wide, doweled and bolted in with ½" bolts and washers.

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Table	52"	22"	...	32"
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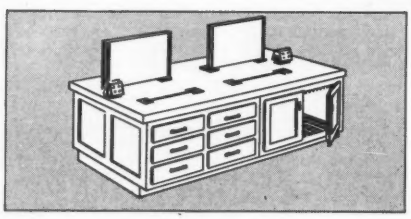
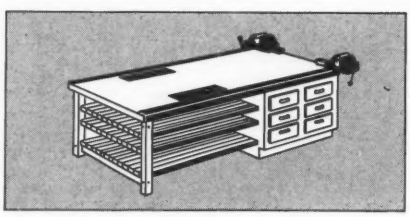
ABOUT YOUR FELLOW TEACHERS

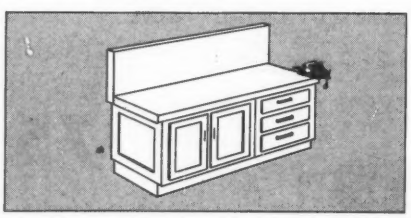
THE assistant superintendent in charge of vocational education in the Chicago, Ill., schools, PHILIP L. MCNAMEE, retired recently . . . EUGENE LARSON has been named an assistant professor of industrial arts education at the Canton Division of the Kent, Ohio, State University. . . . Among recent appointments at Stout Institute, Menomonie, Wis., is that of LLOYD WHYDOTSKI to be assistant professor of printing. He succeeds DARVEY E. CARLSON who has been appointed chairman of the department of printing at Santa Barbara College of the University of California. . . . Appointed to the staff at Iowa State College, Ames, was MERLE O. WEINER, whose teaching fields are woodworking, sheetmetal, and bench metal. . . .WILLIAM E. CASWELL of the industrial arts department of the Millersville, Pa., State Teachers College, died recently. . . . New instructor in the transportation area of the industrial arts division of Oswego, N. Y., State Teachers College is WILLIAM F. TIERNEY. . . . Named to the department of industrial arts at Emporia, Kans., State Teachers College was HAROLD O. WOODS. . . . The new head of the University of Nebraska vocational education department is CLAUDE E. RHOAD, succeeding HARRY E. BRADFORD, retiring. . . . New sales representatives for the Brodhead-Garrett Co. are KENNETH G. ECKLEY, for Indiana and southern Illinois, and CHARLES H. CLAWSON, for Missouri, Oklahoma, and Kansas. . . . ALBERT E. FRENCH has been named director of the New York State Agricultural and Technical Institute at Canton. . . . DANIEL A. PAOLUCCI has been named an instructor in general shop at Oswego, N. Y., State Teachers College. . . . The new supervisor of trade and industrial teacher training for New Jersey is WILLIAM J. FISCHER, replacing JOSEPH M. FAIR. . . . Named to the faculty at Arkansas State Agriculture and Mechanical College, Magnolia, was THOMAS D. BOWLES. . . . The new supervisor of industrial education at Laredo, Texas, Junior College is JAMES L. BOONE . . . . WILLIAM T. MCGREGOR has been named head of the trade and industrial department of West Texas State Teachers College, Canyon.



Wiring Bench



General Shop Bench



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IN THE Morning Mail . .

[Brief comments about SCHOOL SHOP and the field it serves are invited. Address the Editor, SCHOOL SHOP, Ann Arbor, Michigan.

Gentlemen:

On behalf of the many members of the Trade and Industrial Education Association of Pittsburgh and vicinity, I want to express the appreciation of this group for your fine magazine, SCHOOL SHOP.

You are to be complimented for your choice of variety in presenting shop projects every month. I have found the various sections, such as "Strictly Personal," "News," "Instructional Resources," "School Shop Kinks," and "From Washington" timely, interesting, informational, and of great value to me as a shop teacher.

Andrew S. Chuska,
President

Gentlemen:

On page 14 of the January issue of SCHOOL SHOP there is a note entitled "They Come Back at Night." It reports that the school shops of Bethany, Mo., are kept open two hours on Thursday nights for those boys who want to do extra work.

This is a fine thing and all shop teachers should do more of it. However, I believe that I can top Bethany's record. My shop is open each morning at 8. It is left open during the noon hour; it is open an hour or more every evening after the close of school, and it is also open three hours every Saturday morning. During these extra periods there are always plenty of boys present.

J. R. Chadwick,
Fort Dodge, Iowa,
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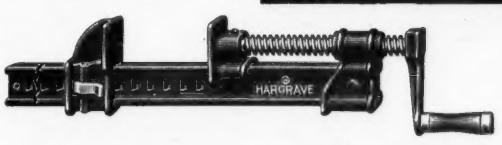

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Cold-drawn steel spindles of the Hand Screw provide long, satisfactory service. Jaws are of selected maple. Fluted handles give good grip under all working conditions. Acme thread offers minimum frictional resistance. Openings are from 3 in. to 14 in. Available with adjustable or non-adjustable jaws.

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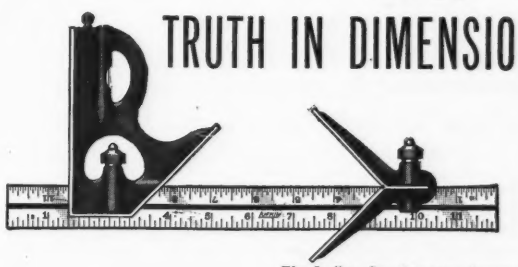

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School Shop KINKS

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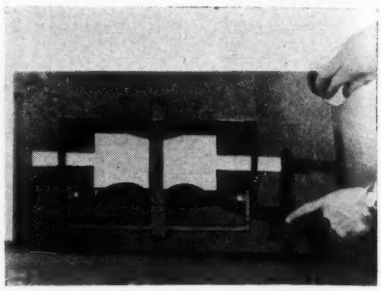
Use "Chrome" Trim

Tin plate, cut in strips and bent to shape on the bar folder, provides attractive trim for bulletin boards, cabinets, or completed projects. Make a channel large enough to accommodate carpet tacks. Slide the tacks in and space them along the length of the strip so that they can be lightly tapped onto the surface which is to be "chrome" trimmed. Steel wool can be used on the strips to bring out a pewter-like finish.—*Fred M. Kilbourne, Memorial High School, Pelham, N. Y.*

Visual-Training Aid

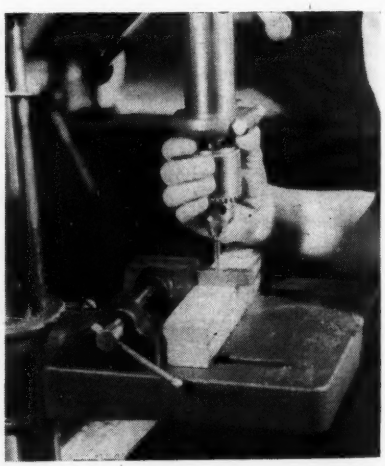
Here is a visual aid which is simply made and will be of much value in shop demonstration procedures. Use masonite, plywood, or cardboard scraps and showcard paints to construct it. Make a drawing of the item to be illustrated and transfer to the construction materials. All movable parts are individually cut as is the outline frame. Mount movable parts on a backboard in such a manner that they may be shifted in position to facilitate classroom explanation. Illustrated is a hydraulic valve. Note that the light colored portion is free to move, being held in position by small pieces which are glued to bridge the frame outlining the valve. Clear lacquer can be



used as a finish for the entire unit.—*J. W. Rocke, Globe, Ariz., Vocational School.*

Tapping Tips

Tapping metal is frequently a problem. Here are two ideas which may help to solve it. First, whenever possible the tap should be started by holding it in the drill press, turning by hand without power. This insures a perpendicular start. The second tip is that metal when held in a vise should be so held that the



hole to be tapped is just outside the jaws of the vise. This keeps the pressure of the jaws from binding on the tap.—*William B. Doose, North Hollywood, Calif., Junior High School.*

Add Solvents

I have found that nail polish remover is an economical and easily accessible substitute for plastic wood solvent.—*Stan Schirmacher, Tempe, Ariz., Union High School.*

SHARE your teaching secrets with others. Send in *Kinks* for use in this section.

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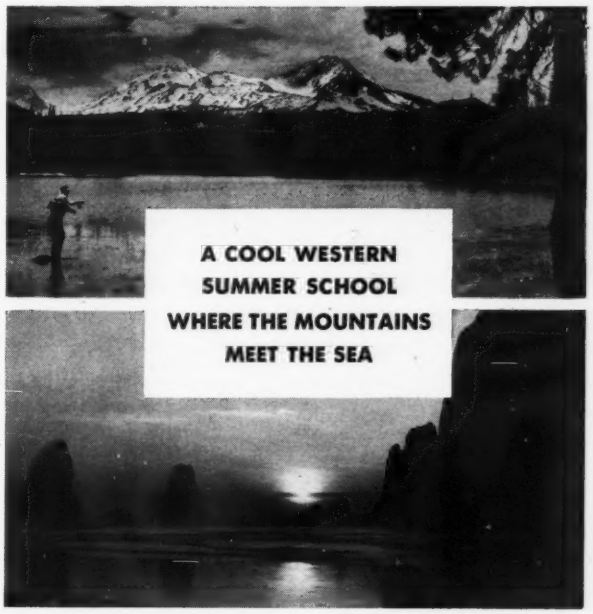

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Wall Shelf Project with Drawer Feature

By Arthur F. Schuster
Gaskill Junior High School, Niagara Falls, N. Y.

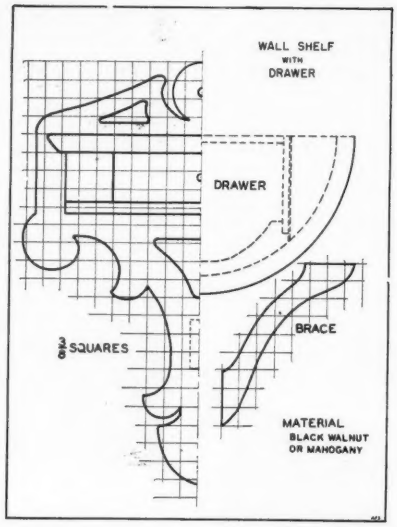
Here is a woodworking project that will provide the student with a usable home decoration and which will test his skill in several technics.

TESTED PROJECT

GOOD use may be made of this project in the woodworking shop. A wall shelf which contains a drawer serves as a worthwhile project in that it utilizes many basic and advanced woodworking technics and is an acceptable object for the home. Every room has space for wall shelves; a variation comes in the production and use of shelves in pairs.

Although the project calls out the craftsmanship of the shop student it does not require much material. Any suitable wood can be used, black walnut or mahogany being preferred.

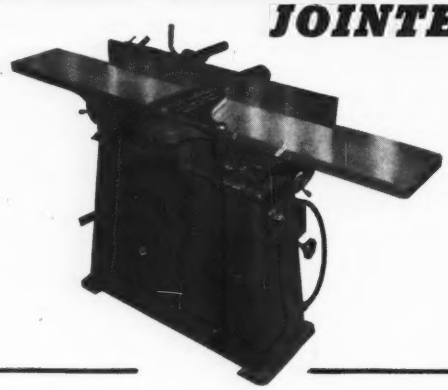
The secret of success in making this shelf lies in the care with which the pattern is cut and then in how it is followed. Use a jigsaw to cut out the pattern. As



indicated on the drawing, paper with 3/8" squares is recommended. Sand off the parts before assembly. Finishing nails and glue can be used to assemble the shelf. Nailing should be from the back, that is, the portion of the project which will be toward the wall. Finish with shellac or varnish. Stock List:

Back, 1/4" thickness
Shelf, 3/8" thickness
Drawer, 1" thickness
Sub-base, 1/4" thickness
Brace, 3/8" thickness

THE NEW SPEED MARVEL 8" JOINTER



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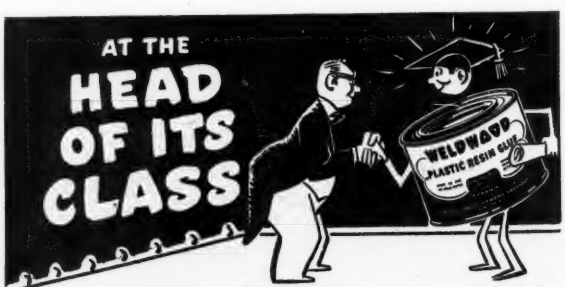

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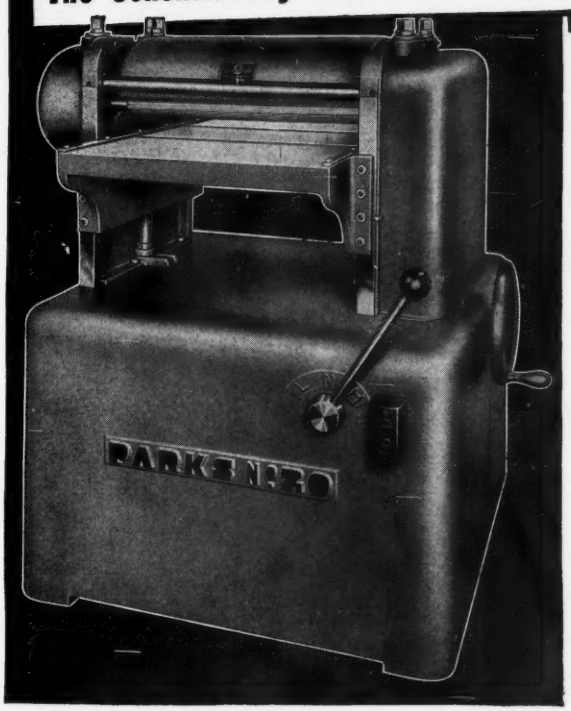

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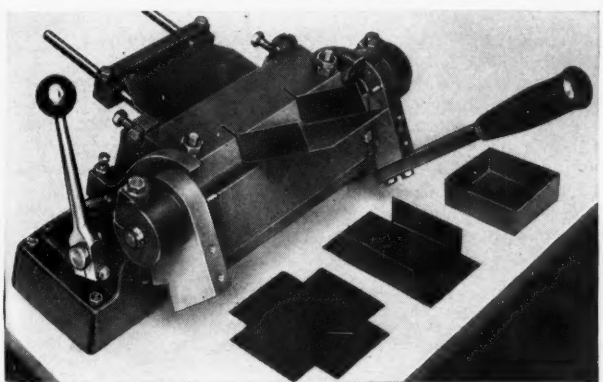

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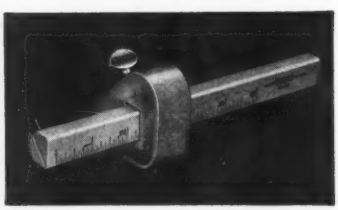
News from INDUSTRY

Franklin Glue Deluged

An offer of free sample tubes of Franklin liquid hide glue to high-school woodworking teachers has brought a deluge of requests exceeding all expectations to the Franklin Glue Company, Columbus, Ohio. The young lady is pictured with only a small part of the four thousand mailing tubes already used in answering requests made on school stationery—with more coming in every day. According to company officials, schools in every state are now using Franklin liquid hide glue.

If you are a teacher of woodworking, and have not yet received a sample, write on school letterhead to Franklin Glue Company, Columbus, Ohio; *or check no. 43 on the coupon.*

Stanley's No. 65 Marking Gauge

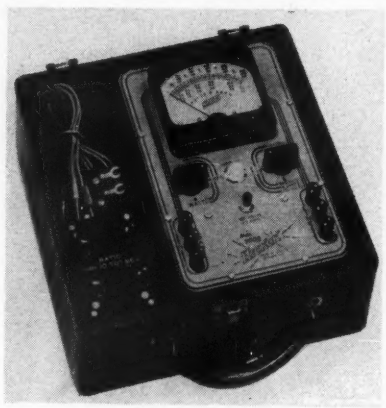


Stanley Tools, New Britain, Conn., announces its new No. 65 marking gage. A distinctive change from the conventional type gage, this new design, coupled with a specially sharpened marking pin which scores a knife-type line, practically eliminates the tendency, as in other gages, to follow the grain of the wood.

The design of the gage permits free movements of the beam and still insures absolute locking when the beam is wedged into the V-shaped opening in the head by the thumb screw and shoe.

For complete details, write Stanley Tools, New Britain, Conn.; *or check no. 44 on the coupon.*

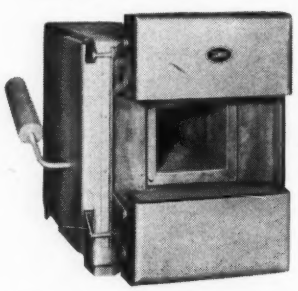
New Volt-Ampere Wattmeter



The new Hickok Model 900B volt-ampere wattmeter is designed for testing all AC appliances under actual use conditions. Incorporates a current transformer for additional ranges of 5,000 and 10,000 watts, and 65 and 130 amperes. Shows wattage consumption, amperes, and line voltage. A new continuity test consisting of a neon lamp connected between line and load binding posts provides a simple but accurate test for shorts in power circuits.

For complete details, write the Hickok Electrical Instrument Co., 10689 Dupont Avenue, Cleveland 8, Ohio; *or check no. 45 on the coupon.*

New TEMCO Furnace



The new Series 1700 TEMCO electric furnaces of the Thermo Electric Manufacturing Company employ a unique and very advantageous door arrangement. To permit access to the heating chamber with minimum loss of heat the heavily insulated door has been divided into an upper and lower section. Both sections are controlled by a single counterbalanced lever. By moving the lever from the forward position to vertical the lower section is lowered separately while the upper section remains snugly in place over the top half of the heating chamber. A further 60° movement of the lever will raise the top section and expose the full chamber. The hot side is always away from the operator.

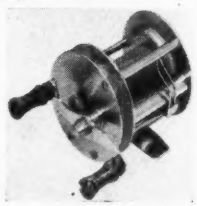
For a full description of the many other outstanding features of this new series, write to Thermo Electric Mfg. Co., 490 W. Locust St., Dubuque, Iowa; *or check no. 46 on the coupon.*

Foredom Announces New Addition to Line

Foredom Electric Co. announces its new No. 8 ball-bearing handpiece—in the handy pencil-size. This new handpiece is a true precision instrument—added to the Foredom line in response to steady consumer demand. Foredom has equipped the handpiece with two sealed precision sets of ball bearings and a finely knurled housing for firm grip. Recommended for all finer jobs of grinding, polishing, cleaning, drilling, milling, engraving, etc.

At the same time Foredom is introducing its low-priced No. 99 Flexible Shaft machine—a complete flexible-shaft power tool. Both of these new tools are more fully described in Foredom's new catalog No. 169-P. Write for a copy to Foredom Electric Co., 27 Park Place, New York, N. Y., mentioning SCHOOL SHOP; *or check no. 47 on the coupon.*

Casting Reel Project Kit



Pioneer Bait and Tackle, Petoskey, Mich., announces the addition of a project kit for their Level-Winding Casting Reel to supplement their highly successful casting rod kit. Shop teacher demand has been high for this addition. Features of the reel are level-wind, helical-cut precision brass gears, bronze bushings, stainless steel, level-wind travel bar for longevity, cork arbor with 100 yard capacity, and universal reel-mounting seat. The kit contains illustrated processing sheets for assembly. Precision machining has been completed on the reel kit. The completion of the project requires careful workmanship, but no special tools are required except regular bench tools.

Shop teachers who are interested in the kit may request a model and a kit for inspection on approval. Write to Pioneer Bait & Tackle, 1201 Waukazoo Ave., Petoskey, Mich., mentioning SCHOOL SHOP; *or check no. 48 on the coupon.*

New Literature

Starrett Precision Tools. A new catalog and handbook of precision tools for automotive, aviation, marine, and farm equipment maintenance. Catalog describes tools, and lists sizes and prices. Handbook section tells best and most efficient ways to go about precision repair and overhaul jobs. Free copy on request from L. S. Starrett Company, Athol, Mass.; *or by checking no. 49 on the coupon.*

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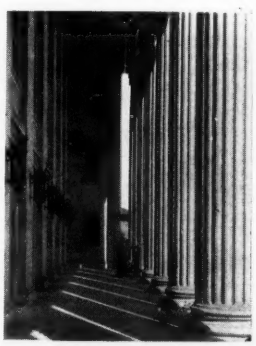

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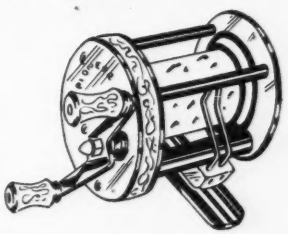
For a dozen students . . . . . or a hundred. For extensive or limited shop facilities, Pioneer Project Kits are TAILORED TO YOUR PROGRAM.

A "natural" with the boys, and "tops" with the instructors because of the high degree of enthusiasm which they maintain, Pioneer Projects have already found their place in school systems in 42 states, although offered nationally for the first time only three months ago.

The Pioneer Casting Rod Project Kit is available in 4, 4½, and 5 foot lengths. Upon completion by the student he is the proud—and we mean PROUD—possessor of a rod which is in every respect the equal of the better rods on the market.



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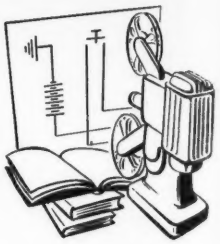

Books:

The New Junior College. Starrak and Hughes. Ames, Iowa: Iowa State College Press, 1948. Pp. v + 63. $1.25.

Subtitled *The Next Step in Free Public Education*, this work examines the coming emphasis on post-high-school education which will "not be necessarily or always collegiate." A horizontal expansion (placing the new junior college somewhere between high school and college) is necessary in our educational system, argue the authors, because of the felt need for a new outlet for education which will provide for those youth who want to enter occupations for which colleges do not prepare or those adults who wish to continue study. Each of these new colleges will offer work according to its community's needs and along three lines: preparatory (preprofessional), terminal, and adult, they believe.

James A. Starrak is Professor of Vocational Education and Raymond M. Hughes is President Emeritus, Iowa State College, Ames.

The Industrial Arts Program. Newkirk and Johnson. New York: The Macmillan Co., 1948. Pp. ix + 357. $5.00.

The first chapter of this book contains a discussion of industrial arts in general education while the remaining chapters deal with the operating program at various grade levels. A chapter each is devoted to grades one to three, grades four to six, grades seven and eight, junior high school, and senior high school. At each level objectives are discussed, teaching technics are given, types of projects are illustrated, and shop layouts are presented in some detail. Questions and problems and a bibliography accompany each section. Numerous photographs and drawings serve to illustrate the text. Teachers, general school administrators, and teacher-trainers will find this book a helpful presentation of the industrial-arts program.

Louis V. Newkirk is Director of Industrial Arts, Chicago, Illinois, and William H. Johnson is Principal, McPherson School.

Graphic Arts Procedures. Karch. Chicago, Ill.: American Technical Society, 1948. Pp. xi + 372. $3.75.

A book written to cover the many aspects of graphic-arts and to outline the many and varied occupations in the industry. It is written for students, apprentices, and those who wish to know about the industry in order to buy and use its products intelligently. Topics treated include understanding the printing process, knowing the type faces, making layouts, setting type, preparing copy and proofreading, and locking up. There is a thorough coverage, in addition, of the different printing processes, as well as those of paper-making, and of bookbinding. A section on getting a job is included. There are projects and selected references at chapter ends.

R. Randolph Karch is director of education, Graphic Arts Industry, Inc., Minneapolis, Minn.

Plastic Arts Crafts. Adams. New York: D. Van Nostrand Co., 1948. Pp. vii + 147. $2.20.

The early portion of this work is devoted to a discussion of kinds of plastics. After that, the learner receives his instructions as he proceeds on one of several projects. Each process is numbered on all projects in the book. Thus, whether making a plastic bracelet or a powder box (typical projects in the book), he can easily refer to the process as it is numbered earlier. There is a section on more complex technics and one on the chemistry of plastics.

John V. Adams is Assistant Professor of Education, New York University School of Education.

Small House Carpentry. Frankl. New York: Prentice-Hall, Inc., 1948. Pp. 95. $2.95.

This is a production of the Training-Thru-Sight Associates. It is aimed at providing a method for determining "how houses can be both designed and built to perform their functions with the least waste of time, material, and effort." The book describes and illustrates the simpler aspects of framing, sheathing, and insulating a small frame house. To aid the student to remember parts and relationships, the instruction is concerned with one house. There are detailed plans for small homes (the "Industry-Engineered Houses") included at the end of the book.

Lee Frankl is Director of the Training-Thru-Sight Associates.

A Brief Course in Strength of Materials. Bischof. New York: Prentice-Hall, Inc., 1947. Pp. x + 93. $1.45.

Because strength of materials is a foundation course for more advanced courses dealing with design of all types of engineering structures, the author here sets out to explain fully the basic principles of the subject, leaving the more advanced topics for classroom instruction. The text contains chapters on simple stresses, beams, columns, and shafts. There are four appendices, including one of selected problems.

George P. Bischof is a teacher in the Brooklyn, N. Y., Technical High School.

Your Bicycle. Kraynick. Peoria, Ill.: The Manual Arts Press, 1948. Pp. 125. $1.25.

Here is a very valuable book to have in any shop library. It gives practical hints on the care and repair of bikes.

Steve Kraynick is a bicycle shop proprietor.

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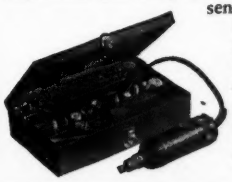

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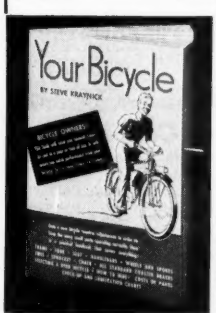

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The *Newsmagazine* of the New Jersey Vocational and Arts Association in a recent issue said:

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Pamphlets:

Douglas Fir of the Western Pine Region and **Larch of the Western Pine Region** are two pamphlets prepared by the Western Pine Association. Each takes up the special uses, properties, and various grades of the wood named in the title. The pamphlets are lithographed on slick paper and are well supplied with clear photos and tables. Single copies on application to the Western Pine Association, Yeon Bldg., Portland 4, Oregon.

School Shop Safety Manual is a paper-bound book prepared by the Board of Education of the City of New York. It covers the responsibilities of both instructor and student in all phases of school shop operation and maintenance. There are sections devoted to various types of shops and to specific problems of safety likely to be met in each. Copies of the manual are available in limited quantities for vocational and industrial-arts teachers at 55c each. Requests should be sent to the Board of Education, Bureau of Vocational Activities, 110 Livingston St., Brooklyn 2, N. Y. Remittances should be made out to the order of the Board of Education. Do not send stamps.

Industrial Arts for Secondary Schools is a paper-bound booklet of 190 pages which is volume III in the Iowa Secondary-School Cooperative Curriculum Program. Designed to present "some of the currently approved practices in industrial-arts teaching, supplemented with selected lists of books, equipment, and other material," the volume was prepared by a group of Iowa teachers under the chairmanship of W. H. Wagner of Iowa State Teachers College, Cedar Falls. The material is of particular help to small high schools. Available for 75c from the Department of Public Instruction, Des Moines, Iowa.

Convenient Tables and Formulae is a handy, pocket-size booklet published by the Westinghouse Electric Corporation. The booklet contains numerous terms, conversion tables, formulae, and other hints on electrical maintenance. It is printed as a part of the company's maintenance service. Teachers may obtain free copies by writing to Westinghouse Electric Corp., 306 Fourth Ave., P. O. Box 1017, Pittsburgh 30, Pa. Please mention SCHOOL SHOP.

Correction: The booklet, **Safety Education in the School Shop**, issued by the National Safety Council, Chicago, Ill., and mentioned in these columns last month, is available at a charge of 60c a single copy, rather than free.

Visuals:

Craftsmanship in Clay: Simple Clay Methods is a 16mm sound motion picture in color produced at the Audio-Visual Center of Indiana University, Bloomington. Running time is 10 minutes. It portrays methods by which pottery pieces are made from clay. In it simple slab pieces are rendered by an expert potter who demonstrates tools and proper use thereof. The price is $75 and may be purchased at the Center or from Educational Library Film Association, Suite 1000, 1600 Broadway, New York City 19. Rental may be arranged.

ATF Printing Instruction Charts are a set of 24 visual aids, each 11" x 14", produced by the Education Department of the American Type Founders. They are valuable for use in all instruction for printing and the allied trades. Typical charts are: A Font of Type, How to Tie Up a Page of Type, Standard Proof Marks. Sets can be ordered for $3 at ATF branches in most principal cities.

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Washington . . . *from page 32*

tional vantage point believe they can spot the beginning of two interesting trends.

First is a trend away from the publication by a state department of education of a single course of study for industrial arts—toward the publication, several times during the year, of many brochures devoted to broad resource units. Such brochures provide a more flexible medium for mirroring industrial-arts principles and teaching practices than the blue-printed, single-type course of study.

The second trend is away from the individualized shop project in which a boy or girl concentrates on his or her own gadget—toward a group type of project in which several pupils share their labor, skill, and experience.

The Grist Gets Heavy.—So many educational bills have been poured into the Congressional legislative mills that it will take a major unraveling, unsnarling, and untangling operation to get them ready for debate in either House.

Federal-aid-to-education bills are competing with bills for school-building construction; federal scholarship bills duplicate the purposes of the National Science Foundation—and both measures for such purposes appear to make unnecessary bills creating student loans. Yet, student loans are among the more popular proposals now being written into bills by Congressmen and Senators.

At the same time, groups which want federal aid for parochial schools and those who oppose such aid; groups which want to abolish overnight racial segregation in education and those who oppose them—all are ready with their amendments to all types of legislation. All this spells trouble for educational legislation in the 81st Congress.

We Backtrack.—Last month your correspondent had an item about the concern of various governmental officials including the Labor Department about the small number of apprentices now being trained. We mentioned that some officials believe that every military contract with industry should contain a proviso that a certain percentage of apprentices are being trained by the contracting firm. At that point our typewriter slipped when we reported that we were told that a good ratio would be eight apprentices for each journeyman. Obviously, we were in error and meant to say one apprentice for every eight journeymen which is the current average for the building trades.

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Japan . . . *from page 8*

Supervision Needed for 20 Years

We should supervise Japanese reconstruction for no less than 20 years. Several generations of Japanese, school-age generations, should be educated in our ways of life. If the peace should be signed and if we should leave Japan soon, the Communists would quickly take over and we would have Russia, China, Japan, and Korea linked together in future considerations of world peace. It would certainly be unwise for us to build up Japan economically without also changing the thinking of the people in regard to our ways of government. Our greatest hope for the future is with the children. We built our democracy by educating our children. And so the Japanese must be educated in the ways of democracy, but it is a long, slow process.

Another reason for continuing the occupation is that considerable time will be necessary for the Allied reforms to become crystallized and deep-rooted. There must be a strong guidance until they become so, and the Japanese economy must be established so that the need for American relief and Japan's questionable world credit are no longer clouding the attainment of recovery goals.

Russia Has Her Eye on Japan

It is believed that Russia's interest in Japan is greater now than is her interest in Europe. She is increasing her efforts to win over the Japanese through underground methods.

Whether Russia likes it or not, we may soon have to permit Japan to rearm again. Otherwise we will have to keep a few hundred thousand more well-equipped troops of our own over there for a good many years to come, and that would be costly. Basic to all arguments for continuing the occupation or for rearming Japan is the fact that the people must first of all believe in and practice democracy—government for the people and by the people. Until we can be certain of that, we should remain there whether the Japanese like it or not.

It is belief in, and practice of, democracy that will keep the Japanese from joining the Soviets and turning against us. We must have the Japanese on our side, whether in peace or in war. You can see what a tremendous task the 100 American educators in Japan are facing. The number should be tripled if we are to do a ready and effective educational job.

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FROM WASHINGTON

BY MICHAEL PACA

WHAT is happening in the vocational education skies? Is this a cloud-no-bigger-than-a-man's-fist we see gathering there?

Last month the organized school superintendents, through the American Association of School Administrators, declared that all federal funds should be allocated "for general as opposed to restricted and specific educational purposes." There is no question that this was a barb against federal appropriations restricted to vocational education.

Soon thereafter came Mr. Herbert Hoover's task force with its recommendations on federal grants. The ex-President heads a commission to study organization of the federal government and its relations with the states.

At first, the task force recommendation was sweeping. "We recommend that all separate grants for social, educational, and public health should be rescinded and one grant designated for these purposes in general," the group said in a preliminary report.

After some thought, however, the Hoover Commission decided not to go along with this recommendation. "We do believe, however," said the Hoover group in effect, "that there is overfragmentation in the present system—or lack of system—of grants-in-aid.

"We recommend that there be fewer grants, but for broader purposes. This would permit the individual states to emphasize, within a given field, their particular needs. The needs of each state will differ within broad limits. For example, a single broad grant for education would be more effective than the existing separate grants for school lunch, vocational education, land-grant colleges, and vocational rehabilitation. The states could thus give emphasis to their particular necessities within the broad field of education.

"We believe that national funds should not be used to replace state effort, but rather to stimulate states to maintain minimum standards which are of interest to the nation as a whole. Such grants should be limited to those states which do not have the capacity to maintain such standards.

"We recommend that the amount of such grant to a state should, therefore, be related to the financial capacity and willingness of the state to meet the need, and not to population.

"The Congress should insist on uniform audits, the right of investigation, and proper reports in terms of costs and results," the Hoover group concluded.

Before Mr. Hoover sends his final report to Congress, there may be some revisions in language. But there is no doubt that the sentiment for broader grants-in-aid is growing. The next five years may see a change in the federal government's role of promoting vocational education.

VTWPW Out of Limbo?—Last month this Letter reported the activities of one group whose job is to prepare for war.

This month comes the story of another group of gentlemen of the sword and the atom who are studying war—the Army War College. On January 18, the War College heard a speech by an industrialist on the "Training of Workers for War Production," meaning, of course, "the next war."

The industrialist (name on request) began by telling a story. During the war with Hitler, the industrialist's training organization was training a group of leaders and supervisors in a textile plant in Coventry, England.

Before the training program was over, Coventry was bombed by Hitler's planes. The American training firm cabled Coventry to find out if they wanted to go on with their program.

"Yes, by all means," was the reply.

The industrialist then told the War College audience that our greatest problem in training for war production (next time) will be one of human relations; that the need for better foremen, leaders, and supervisors will be paramount.

The industrialist had these additional suggestions for placing our training resources on a preparedness basis:

First, he asked that contractors who are now making war materials supply to national training officials lists of skills required and the number of man-hours of each skill per unit, in order that a training load of skills could be quickly prepared in case of emergency. He asked also that the manufacturers prepare *now* visual aids required for training. These aids, he suggested, should be placed at the disposal of vocational schools so that they could be quickly thrown into use in training laboratories.

He then urged that vocational schools carry on "pilot" work *now* on the training of the special skills designated for war manufacturers.

Finally, he suggested that vocational schools learn to work in closer cooperation with trade unions "so that vocational schools can produce actual parts to tolerances required by contractors and be, in a sense, subcontractors."

Industrial-Arts Movements.—Those who watch industrial arts from a na-

(*Continued on page* 30)

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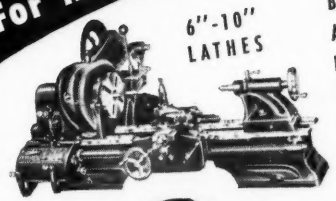

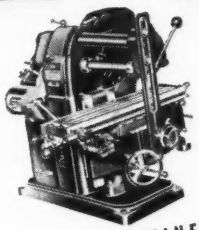

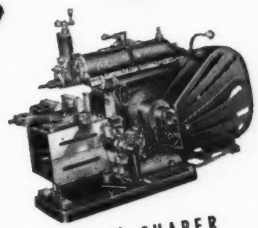

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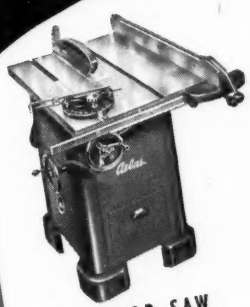

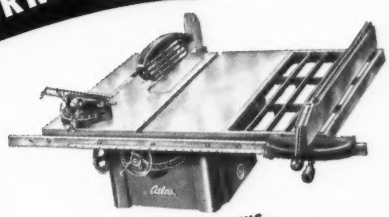

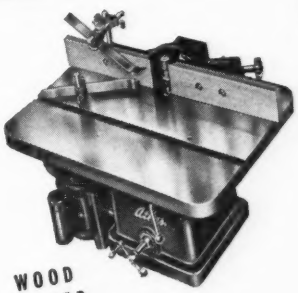

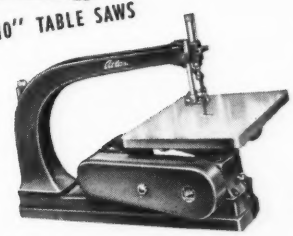

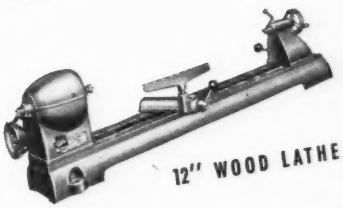

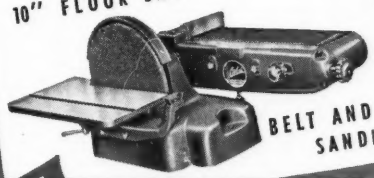

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